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THE MTBE CRISIS AND THE FUTURE OF RENEWABLE FUELS

HEARING

BEFORE THE

COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

ON

THE MTBE CRISIS AND THE FUTURE OF RENEWABLE FUELS

APRIL 11, 2000

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THE MTBE CRISIS AND THE FUTURE OF RENEWABLE FUELS

TUESDAY, APRIL 11, 2000

U.S. SENATE,
COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,
Washington, DC.

The Committee met, pursuant to notice, at 10:11 a.m., in room SR–328A, Russell Senate Office Building, Hon. Richard G. Lugar, (Chairman of the Committee,) presiding.

Present or Submitting a Statement: Senators Lugar, Fitzgerald, Grassley, Harkin, Daschle, and Kerrey.

The CHAIRMAN. Let me ask the permission of the distinguished Ranking Member and others for Mr. Woolsey to testify before we give our opening statements. He has a plane and will need to leave us about 10:30. So in order to utilize our expert witness to give us an overview, as he has so adeptly on past occasions in this area, I would like to call upon Mr. Woolsey now.

It is great to have you before us again.

STATEMENT OF R. JAMES WOOLSEY, WASHINGTON, DC.

Mr. WOOLSEY. Mr. Chairman, thank you very much for indulging me, and also I thank the other witnesses. I have a trial tomorrow in Los Angeles and I really can stay until about 10:45, I suppose, but I do need to get to the airport and I really appreciate the Committee's consideration.

I testify most definitely in support of Senator Daschle's bill, but I would like to try to put it in some sort of a strategic context, if I might. And rather than read from my 5-page statement which I would ask to be submitted for the record, I will just speak from a few notes on the general subject.

The CHAIRMAN. It will be published in full.

Mr. WOOLSEY. Politics, I think, often in this country, Mr. Chairman, and I suppose elsewhere as well, involves using events to create an opportunity to make lasting, positive changes, and I would emphasize the word "lasting." I was in high school when the Russians launched Sputnik, and at the end of the Eisenhower and beginning of the Kennedy administration, legislators on the Hill took that opportunity of concern by the American people to begin a fantastically successful space program for the United States. They used that event to create an opportunity for the country.

Now, today, with gasoline and diesel fuel nudging toward $2.00 a gallon, truckers' strikes, the taxi driver who brought me here this morning complaining about cost of gasoline, and the country having discovered, I think somewhat belatedly, the toxicity of MTBE in

groundwater, we have a series of events that produces an opportunity for the Congress to take action for a very lasting and positive change, one that would move this country, and I think ultimately the world, away from what is in many senses a costly and dangerous and increasing dependence on Mideastern oil for our transportation fuel.

My hope is that a decade or more from now when we have begun to make a substantial dent in our own oil dependence by using principally biomass-based ethanol, the country will look back on this committee's contribution and Senator Daschle's bill as it looked back in 1969, when our astronauts walked on the moon, toward the legislators who made very substantial contributions to that program in the late 1950s and early 1960s.

The reason I mention particularly biomass ethanol is that I believe it is for a major substitution for petroleum products in this country the fuel of the future, and I say this for several reasons. Let me put it this way: I refer at the end of my statement to a possible coalition between cheap hawks, tree-huggers, do-gooders, and farmers. In the interest of parallelism, I almost said sodbusters, but before the Agriculture Committee I didn't want to say anything that might remotely be taken as derogatory of farmers.

I am a member of the first three of those groups, Mr. Chairman. I once worked on a farm for a summer, but I certainly can't claim to be a farmer. But in the 3 ½ years since you asked me to testify here on this issue, I have become increasingly familiar with some of the issues in rural America and I think I understand them a lot better than I did then.

Let me say why I think each of these four groups, which I think encompasses a very substantial share, in toto, of the American population, should have an interest in moving toward biomass ethanol as a substitute for petroleum-based products.

First, the cheap hawks, those of us who are interested in national security but don't want to fight any more wars in the Mideast than are absolutely essential. The Mideast, the heart of two-thirds to three-quarters of the world's proven oil reserves, is the home principally of two types of regimes—pathological predators and vulnerable autocrats.

And in 1990–91, we went to war because one pathological predator, Saddam Hussain, conquered a vulnerable autocrat, the ruler of Kuwait. When Saddam stopped at the Kuwait-Saudi border, he was about 100-miles from controlling over half of the world's proven oil reserves.

Increasingly, in years to come, the rest of the world will depend on the Mideast. The King Hubbert models of petroleum exploitation, which I think history has proven to be the best and most objective, increasingly point to world oil production beginning to turn down sometime between 2010 and 2020, which is just barely tomorrow in the world of resource allocation. The longest-lasting reserves, however, and those that the rest of us will increasingly come to depend on are those in the volatile Mideast.

The tree-huggers should have two major concerns in this area—global warming gases and air and water pollution. Now, certainly with respect to the emission of CO–2, biomass-based ethanol beats virtually all other fuels hands down. The DOE five laboratories'

study a year-and-a-half ago put biomass-based ethanol at approximately a hundred times better than electric vehicles in terms of CO–2 emissions.

The reason is, of course, that although you are driving an electric vehicle in Los Angeles and you are not putting any CO–2 out the tail pipe, CO–2 is certainly going up into the atmosphere from the natural gas or coal that is being burned at Four Corners to supply that electricity.

On global warming gases, it is a debate whether, depending on exactly how it is done, biomass ethanol in its overall life cycle either adds a tiny share of CO–2 to the process or is a slight sink. But it is so many more times better than any other solution in terms of global warming gases that alone, I think, is a major argument in its favor.

As most everyone in this room knows, there is a problem at mixtures of ethanol and gasoline below 22-percent ethanol with a slightly higher vapor pressure in the tank which leads the slightly higher pressurization to lead to not emissions out the tail pipe increasing, but rather evaporation carrying some pollutants into the atmosphere, particularly in summer and particularly in circumstances in which air pollution involving ozone is a serious problem.

There are several ways to deal with this problem for ethanol. One is to encourage oil producers, as I understand Getty and Tosco are now beginning to do, to remove butane and pentane, which is what creates this somewhat perverse effect of adding ethanol below 22-percent in hot weather.

Another possibility is for RFG areas such as California and New England not to add ethanol in summer months, but to be permitted some type of credit trading, as I understand is envisioned in Senator Daschle's bill. And a third possibility, of course, is continuing to give incentives through the CAFE standards and otherwise for the production of flexible-fuel vehicles. Many, for example, of the Ford Tauruses that now come off the line can burn up to 85-percent ethanol, and indeed all automobiles in Brazil are of this type. It is not rocket science; it is a slightly different type of plastic in the fuel line and a computer chip in the fuel system. And it is free; it doesn't cost you anything extra if you want an FFV from the automobile manufacturers that do that. Certainly, with respect to groundwater, given the toxicity of MTBE, again, ethanol of any type is a slam dunk improvement over MTBE for a fuel additive.

The third area, the do-gooders, is what I refer to as those who are particularly concerned with Third World poverty. Most Third World nations, such as in Sub-Saharan Africa that are heavily in debt, are heavily in debt very much because of their oil bills. They have to import expensive dollar-denominated oil and they have only agricultural commodities, which suffer from the same low prices as our farmers do in this country, to export.

As a result, the countries are heavily in debt and the individual subsistence farmers are heavily in debt. If they can sell their field residues to a local ethanol producer as a way of making some extra money, and incidentally supplying transportation fuel for the regions around them, the economics of many Third World countries, and particularly the poorest parts of them, turn around.

And, finally, farmers and those in rural America generally here in the United States. We spend many tens of billions of dollars a year importing petroleum and petroleum products into the United States. Each $1 billion worth that we could replace with ethanol in this country is something on the order of 10,000 to 20,000 jobs in rural America. I believe that there can and should be some growth in the use of corn-derived ethanol as well, and that will be a positive thing.

On many of these fronts, corn-derived ethanol is as good as biomass. But for a really substantial increase, one will need to be talking about biomass-based ethanol. And I was particularly pleased to see last year Senator Harkin introduce a bill permitting the use of grasses, for example, from CRP lands to be used solely for energy purposes, a step which could lead to very substantial biomass being available for ethanol production.

Let me close, Mr. Chairman, with just a quick word about ethanol producers and oil companies. Both of these institutions do a wonderful job for America in producing many, many products. Both, I think, face a choice as the genetic engineering of biocatalysts and production improvements in biomass ethanol begin to make possible the very substantial use of biomass ethanol as a substitute not only for MTBE but for gasoline generally.

If I could draw an analogy, in 1964–65 when the first silicon chip came off the production lines and it began to be possible to make transistors essentially out of sand rather than out of metal and plastic, IBM, as the dominant computer company in the United States, indeed in the world, used some chips. It mainly used them, though, in mainframes and it saw itself as the mainframe computer company for the United States and the world, and for some several years it prospered in that world.

In the meantime, however, at Xerox PARC and at Apple and some other places, people were beginning to use sand-based transistors in a rather new and more creative way. And although IBM prospered in the late 1960s and early 1970s, it fell on hard times shortly thereafter because it took it some years to realize that being able to make transistors and integrated circuits out of sand had fundamentally changed everything.

Now, it would be my very strong hope that those excellent companies that produce ethanol from corn in the United States today, as well as American oil companies, would see that over the long run that transition is best made sooner rather than later, and would be not reluctant but rather enthusiastic participants in the transition to what my friend David Morris calls a world oriented toward an economy based on carbohydrates rather than hydrocarbons.

Thank you, Mr. Chairman.

The CHAIRMAN. Well, thank you very much, Ambassador Woolsey. In your longer statement, you have mentioned—and I appreciate our collaboration on the article for Foreign Affairs on this issue. In that article, we called for more research and development.

Could you outline what needs to happen? Under what conditions is biomass ethanol economical? What is the status of research, as you see it, in industries quite apart from the Federal legislation

that has passed the Senate which we hope will pass the House that might give some spur to this?

Mr. WOOLSEY. It is my understanding, Mr. Chairman, that improvements in the use of various processes have led to biomass ethanol now or in the very near future being able to be produced for something just over a dollar a gallon. One really needs another substantial reduction of something on the order of 50-cents a gallon in order to begin to make ethanol competitive on a more or less equal basis to gasoline, since gasoline has about 30-percent more energy on a volume weight basis than ethanol does.

And one can't count on these oil prices staying up at $25, $30 a barrel forever. I think they are likely over the long run to go up from where they are now, but there could be panic-inspired increases in production and cuts in oil prices as the oil-producing countries of OPEC especially begin to see the United States and other countries turn toward alternative fuels. One of the best ways to get their attention to reduce oil prices, by the way, is to promote things like biomass ethanol.

In any case, to get that 50-cents or so a gallon out of cost, one really needs to be able to do two things, one of which has already been accomplished. One needs to be able to use both cellulose and hemicellulose, which together account for something on the order perhaps of 80- to 85-percent of what grows, rather than only being able to use starch, which is a tiny share of what grows.

In order to be able to use 80-percent or so of what grows or has grown, including waste paper, one needs to be able, first of all, to use the chain of hemicellulose, the a polymer of C5 sugars molecules. C5 sugar cannot be naturally fermented by baker's yeast, so even though it is easy to break that polymer down, that chain of sugars, by heat and otherwise, even when you have the C5 sugar, up until relatively recently you couldn't do anything with it. There have now been genetically-engineered biocatalysts, several, that are able to ferment C5 sugar and turn it into beer, then distilled into ethanol. So one of the two problems is now solved.

A second problem—and the one that I take it your bill and President Clinton's executive order of August and a number of other efforts at the National Renewable Energy Laboratory, at several universities and at several companies are now focusing on—is how to break down these long chains of cellulose quickly and easily in order to get the molecules of C6 sugar which, of course, can be fermented by baker's yeast, just as human beings have been doing for thousands of years.

It is breaking that polymer, that long chain of cellulose, probably with a genetically-engineered enzyme, that remains to be done. I understand there is substantial progress on it. I also understand there are some light acid solutions and steam solutions and otherwise that can make progress toward breaking that chain down.

But once that chain can be broken quickly and efficiently by an enzyme—there are enzymes that will break it today, but they don't do it quickly and efficiently enough—I think one will begin to see some very long faces over in the Persian Gulf. And I don't know whether that is months away or a year or two or three away. In the meantime, even based only on the process improvements that have been made to date, it is my understanding one ought to be

able to look toward production costs of maybe another 20, 25-cents lower per gallon for ethanol. But the really big breakthrough, being able to hydrolyze cellulose cheaply and efficiently, is really still to come.

The CHAIRMAN. Senator Harkin, do you have a question for the witness?

Senator HARKIN. Thank you, Mr. Woolsey. I thank you for your interest in this area and your leadership in this area. Just a couple of things. The issue of fuel cell technology is another exciting development, and every time we are talking about ethanol and starch-based and cellulose-based—I am glad you pointed out that we are not quite there yet—most people think in terms of the internal combustion engine.

Have you thought about how you might use renewable resources to extract hydrogen for use in fuel cell technology?

Mr. WOOLSEY. Yes, Senator Harkin. It is an excellent question. Arthur D. Little, which, is involved in the development of one of the leading fuel cells, held a press conference the day after the executive branch announced that they would be able to use gasoline in their fuel cells. A.D. Little held their press conference and said that the fuel of choice for their fuel cell was ethanol because of its environmentally sound characteristics.

Indeed, for most fuel cells, as I understand it, it is a relatively simple matter to be able to use ethanol in them as an alternative to gasoline either for mobile fuel cells or the stationary ones, such as will apparently go on the market within a few months from Plug Power, along with General Electric. Those uses of ethanol in fuel cells raise the possibility that using switchgrass from the CRP lands of some 30-million acres, as the bill you proposed last year suggested might be done, could have a huge impact on our ability to fuel the entire American transportation system with carbohydrates instead of hydrocarbons.

Professor Lee Lynd at Dartmouth has estimated that using a percentage of the agricultural wastes and using the switchgrass from the CRP lands, even at today's mileages one could replace 25- to 30-percent of the gasoline in the country. And if you have fuel cells in cars getting 70- to 80-miles a gallon instead of the some 20-miles a gallon that one gets on the average today, then biomass ethanol used in the fuel cells in those vehicles from 30-million acres ought to be able, according to his calculations, to replace all of the gasoline that we currently use in the transportation fleet.

So fuel cells, and indeed hybrids even before fuel cells, create the increasing ability to use biomass ethanol in very large volumes to replace gasoline more and more as the mileage increases on cars-without putting new land into cultivation, without putting marginal land into cultivation, without replacing any farm land that is now used for feedgrains or food crops, and without damaging the environment.

Senator HARKIN. Thank you very much. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Daschle?

Senator DASCHLE. Thank you, Mr. Chairman.

Mr. Ambassador, I appreciate, given your schedule, that you have been able to come today. I viewed you as a national security

witness, but you are every bit as good a technical witness, and we are very pleased with your contribution this morning.

I like your categorization of cheap hawks and tree-huggers and do-gooders and farmers, and was especially appreciative that you rolled into that consumers and oil companies because I think there are both of those categories as well.

Could you, in the short time that you have, go back to that first point you made about national security and disruptions and pathological predators, as you have indicated? If you could look into your crystal ball, what do you see happening in the Middle East in the future? Do you expect more price hikes, more possible disruptions, given the leadership in the Middle East, especially in certain countries upon which we are dependent for sources of energy today?

Mr. WOOLSEY. Well, I do, Senator Daschle. I wish I didn't see such things, but I have a hard time seeing anything else. Saddam unfortunately is going to be around for a good deal of time, I am afraid. And in Iran, although there have certainly been positive developments in the elections with President Khatemi, Iran is still the number one international sponsor of world terrorism. And the Iranian military and security services and the like are still solidly in the hands of the very hard-core mulllahs that are the real power in Iran.

I think that both because of the situation in those two countries and because of the overall history of the Mideast and the Persian Gulf, it is highly likely that sometime within the next decade or two we will see, together with oil price increases, some type of threat utilized against us in terms of very, very sharp-almost penal from their point of view-price increases on the one hand, or oil cutoffs on the other.

Certainly, even Saddam and even those who rule Iran need to sell their oil. And people say, well, we don't really need to worry about this because even if they are bad folks, they will have to sell it to us. Yes, but being as wealthy as those countries fundamentally are, they can afford to have substantial periods of time in which they pump low amounts or in which they use pressure on us to try to threaten, for example, our support of Israel or Turkey or any of the moderate regimes in the area.

I think it is really very foolhardy for anyone to assume that we are going to go through the next decade or two without one or more major crises in the Mideast, including ones that could lead to a cutoff or very, very sharp increases in oil prices as essentially a penalty leveled on the West.

The King Hubbert models that I referred to-that I think most objective outside analysts use to assess the state of things in oil reserves—the optimistic versions tend to say it will be 2020 before world production tips down, and at that point production costs tend to go up very sharply. The pessimists tend to say 2010.

The only outlying estimates that are more optimistic than that, that I am aware of from an objective institution are those from the U.S. Department of Energy. I have said in the past that they don't use other peoples' models. They use the Julie Andrews' model, as in "I am Just a Cockeyed Optimist." And there are, of course, OPEC estimates that are different. There are oil company estimates that are different. And there are people who look at the tar

sands and heavy oil deposits and say, "look how much of that there is." But those latter have substantial environmental and economic costs in exploitation.

So if you are looking at regular crude, I think most objective assessments would say sometime between 2010 and 2020, world production starts to turn down. And the Mideast will be the last place where it will turn down, so it will be the place that we will all have to go.

Senator DASCHLE. Well, over the last couple of decades, I think those of us who have advocated ethanol have looked at it from the tree-hugger environmental point of view, from the do-gooder or what is the right thing to do from an energy perspective, and we have certainly looked at it from the farm point of view.

But the essence of your testimony from my perspective is what you have just said about national security and about the predictions about disruptions and price hikes and the lack of continuity in available supply in the future. That is what is really the premise of this new legislation, that we look at national security issues and our dependency upon foreign sources a lot more carefully than we have in the past, and that too ought to be a motivation in our creation of good energy public policy.

So from that perspective, especially, but also from the other perspectives that you so adroitly addressed this morning, let me thank you. I thought it was very, very good testimony. I appreciate your being here.

Mr. WOOLSEY. Thank you, Senator Daschle.

The CHAIRMAN. Well, thank you, Senator Daschle.

Let me just say that Senator Daschle's legislation you have commended, and properly so, and Senator Harkin's efforts. When you last appeared and when we wrote our article, we predicted OPEC would strike again. Now, our constituents out at the pump now put that as the major issue in American life, and they say why was there no leadership, why was there no vision? Well, right here in the Ag Committee, a lot of vision and a lot of leadership. The problem is that we have not made the headway we need to make.

Now, fundamentally, Senator Daschle's question on national security is critical. It is as clear as any of us can see right now we are going to have spikes of oil that will disrupt our economy, and it may or may not be controllable and it will happen before 2010. It may happen as soon as next week, as OPEC discovers that the price of oil has gone down 31-percent and they say, we are tired of this and we are going to turn off the spigot, despite the meeting we just had.

If we are so short-sighted as not to be able to meet this in an environmentally-satisfying way and in a way that helps our farmers and our producers, shame on all of us. It is absolutely as clear as it could be. So this is why we will continue to have these hearings, and I hope that Foreign Relations and the national security committees and what have you will take it as seriously as we do.

We appreciate your recurring voice of wisdom, and I call upon the distinguished Ranking Member.

Senator HARKIN. I just wanted to add to that. You know, we talk about the price spikes and stuff, but there is another side of this, too, that bedevils us, and that is because of the OPEC nations' abil-

ity to control their output, any time that we start investing a lot of money into new plant and renewable energy, they can drop their price and increase their output.

So they always make it so that the market doesn't quite meet what we want to do. So then we hold back, we don't invest, and they spike the price up again. Well, then we make motions like we do to have more production of renewable energy, and they drop it back down again. And so somehow it seems to me that we have just got to bite the bullet, so to speak, to use that colloquialism, and we have just got to forge ahead in this regardless of what they do with their output at any given point in time.

Mr. WOOLSEY. Senator Harkin, I think that is exactly right. We are Charlie Brown and they are Lucy with the football.

Senator HARKIN. That is right.

Mr. WOOLSEY. And it has been that way for a long time.

Senator HARKIN. I like that.

Mr. WOOLSEY. And I think, Mr. Chairman, if the complaints from my taxi driver this morning about gasoline prices are any indication—that is my polling, Washington taxi drivers—once the taxi drivers join the Agriculture Committee on this issue, I think we are going to win.

The CHAIRMAN. Well, we thank you again very much for coming to take part in this hearing.

Mr. WOOLSEY. Thank you, Mr. Chairman, Senator Harkin, Senator Daschle.

[The prepared statement of Mr. Woolsey can be found in the appendix on page 58.]

The CHAIRMAN. Let me mention again that a statement from Senator Kerrey has been received by the Chair and it will be included in full in the record.

[The prepared statement of Senator Kerrey can be found in the appendix on page 65.]

Likewise, a statement by Senator Fitzgerald will be included. Senator Fitzgerald will Chair a subcommittee field hearing on MTBE and ethanol next week in Illinois, in his home State. So I want to make note of that.

[The prepared statement of Senator Fitzgerald can be found in the appendix on page 70.]

Now, I know, Senator Daschle, you will need to leave at some point.

Senator DASCHLE. I am going to be able to stay for a little longer than I expected.

The CHAIRMAN. I thought we would give our opening statements, and so I will now give mine. I will call upon the Ranking Member or Senator Daschle, as the case may be, in terms of time.

OPENING STATEMENT OF HON. RICHARD G. LUGAR, A U.S. SENATOR FROM INDIANA, CHAIRMAN, COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

In July of 1999, an independent Blue Ribbon Panel on Oxygenates in Gasoline called for major reductions in the use of MTBE as an additive in gasoline. They did so because of growing evidence and public concern regarding pollution of drinking water supplies by MTBE.

Evidence of water contamination by MTBE was highest in those areas of the country required to adopt, or who had voluntarily adopted, the Reformulated Gasoline Program established by the Daschle-Dole amendment to the Clean Air Act. The RFG program was designed to reduce smog, as well as air toxics, and contained a minimum 2-percent oxygen content to facilitate those reductions.

The Reformulated Gasoline Program was established by the Dole-Daschle amendment to the Clean Air Act, an amendment and an Act which I strongly supported, as did most members of this committee, having participated in meetings convened by Senator Mitchell, Senator Dole, and the Bush administration to draft clean air amendments which were strong and yet cost-effective.

The acid rain provisions of the Clean Air Act have been a huge success, with the environmental economists at the independent and widely respected Resources for the Future estimating public benefits outweighing costs by a ratio of 66 to 1.

The Reformulated Gasoline Program also has proven to be a success in reducing smog, and has exceeded expectations in reducing dangerous and carcinogenic air toxics in gasoline. The second stage of the Reformulated Gasoline Program will commence this summer and will have an even greater effect in reducing ozone pollution and air toxics.

A largely unanticipated effect of the Reformulated Gasoline Program was that MTBE, rather than ethanol, became the oxygenate of choice outside of the Midwest to meet the 2-percent oxygen requirement in the Reformulated Gasoline Program. The reasons why refiners have preferred to use MTBE as an oxygenate rather than ethanol are said to relate to issues of cost and transportation, but they also result from a natural preference by oil companies for a product which they themselves make, namely MTBE, rather than one which they purchase from others, namely ethanol.

Because of concerns regarding water pollution, it is clear that the existing situation regarding MTBE is not tenable. The Governor of California has called for a 3-year phase-out of MTBE in California, and the California Air Resources Board has adopted regulations to that effect. Environmental officials from 8 Northeastern States have proposed a phase-down and a capping of the use of MTBE in gasoline in their States.

Retaining the current oxygenate requirement for reformulated gasoline is certainly a viable solution. A USDA study has shown that it is technically and economically feasible to replace all of the MTBE currently used in reformulated gasoline with ethanol over a 4-year period. A study by the Governors' Ethanol Coalition has projected major benefits to rural economies, farm income and jobs, if ethanol is allowed to replace MTBE as MTBE use is phased out.

Officials from California and the Northeast are requesting legislation to repeal or at least to facilitate waivers of the oxygenate requirement. This alternative would sacrifice some of the energy security and economic benefits of increased ethanol use.

Senator Daschle has presented a compromise proposal which would allow for legislative authority to waive the oxygenate requirements, provided that such authority was accomplished by strict anti-backsliding provisions regarding air toxics and a renewable fuel standard to ensure that markets for renewable fuels will

continue to expand as a result of the MTBE crisis. He includes a biofuels credit in his draft legislation.

As concerns over energy security mount, there is growing recognition of the importance of adopting a national energy strategy which will address the development of alternative fuels. It is clear that MTBE is on its way out. The question is what kind of legislation is needed to facilitate its departure and whether that legislation will be based upon consideration of all of the environmental and energy security issues involved.

[The prepared statement of Senator Lugar can be found in the appendix on page 73.]

I look forward to the testimony of our well-informed and expert witnesses, and I call now upon the distinguished Ranking Member, Senator Harkin, for his opening comments.

STATEMENT OF HON. TOM HARKIN, A U.S. SENATOR FROM IOWA, RANKING MEMBER, COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

Senator HARKIN. Thank you very much, Mr. Chairman. It is hard to imagine a more timely or important subject than the serious environmental problems caused by MTBE and how solving those problems may affect the future for renewable fuels like ethanol. So I commend you for holding this hearing and for your strong support for renewable energy. I look forward to continuing to work with you in that effort.

I want to welcome our witnesses today, and especially want to thank the Governor of my State of Iowa, Governor Tom Vilsack, who is the Chair of the Governors' Ethanol Coalition, for being here.

I remember well working with my colleagues, Senator Daschle and Senator Dole, in 1990 to get the amendment adopted requiring a minimum oxygen content in reformulated gasoline. Senator Daschle and Senator Dole truly led a magnificent effort in getting that done. The Reformulated Gasoline Program has delivered very substantial air quality benefits, and the oxygen requirement has been an important part of RFG's success.

I believe the RFG oxygen standard continues to have value in cleaning up our air. Frankly, though, the oil companies hijacked the RFG program, the RFG oxygen requirement. They rejected ethanol, an oxygen derivative that is renewable, domestically produced, and environmentally-friendly. Instead, for nearly 90-percent of the RFG market, they chose MTBE, which is derived from petroleum, substantially imported, and high toxic and polluting. In just this short time, in one decade, MTBE has become our second most common groundwater contaminant. It has been detected in the groundwater of 49 States, including to a shocking degree in my own State of Iowa.

Now, Mr. Chairman, I have here a jar that has got a clear liquid in it. This is water that was drawn from a well in Santa Monica, California. It has got 600 parts per billion in Santa Monica well water, and I am told that Santa Monica has been forced to close 71-percent of their wells because of this.

Smell it, just take a whiff of that. Let me shake it up a little bit more and get it out of there.

The CHAIRMAN. Get the full benefit.

Senator HARKIN. Just take a whiff of that. That is water from a well. I am going to pass this down. It says "don't drink," but you ought to smell it. It is the craziest thing. This is just water that came out of a well and that is what we are facing, that kind of contamination. Well, MTBE is now on its way out, thank God, because of things like this. National legislation should be passed to ban MTBE forever.

In my view, there are two critical tests for any legislation. First, it must maintain, and preferably exceed, all of the clean air, public health, and environmental benefits in the present law on RFG. second, it must ensure a future for ethanol use that is fully equal to or greater than that provided under current law.

The recent sharp hike in oil and fuel prices, as we just heard from the previous witness, has set the stage for serious discussion about renewable fuels. We are now importing well over 50-percent of our oil, and it may reach 75-percent in 10- to 15-years. Only 3-percent of U.S. energy comes from renewable sources. Ethanol makes up about 1.2-percent, so we haven't even scratched the surface in using renewable fuels.

As important as the RFG oxygen standard is, we must be careful not to place so much focus on it that we lose sight of the potential for using far more ethanol than the RFG oxygen standard itself would provide for. That is why I am so interested in the proposals from Senator Daschle and the administration for establishing renewable fuels requirements. A renewable fuel standard crafted in the right way could result in far more ethanol use than under current law. Renewable fuels hold tremendous promise for improving air and water quality and energy security. They also promise to improve farm income and create jobs and economic growth in rural communities.

So as we consider legislation here, I think of a work day I just spent. In fact, I called you. I remember when you and I spoke that day, I was working at the Sunrise Energy Cooperative in Benton County, Iowa, a new ethanol plant that just came on line late last fall. I spent a day working there. It is a farmer-owned cooperative. It is improving the local farm economy. It is boosting that local economy because they are also feeding that wet mill to cattle. That is the type of enterprise I think we ought to be promoting. It has all kinds of beneficial effects for our country.

So again, Mr. Chairman, I thank you for your leadership. I especially want to thank Senator Daschle for his many years of leadership. He was really the leader, I think, in 1990 in making sure we had the oxygenate requirement in the Reformulated Fuels Program. And I don't want to put words in his mouths, but I daresay that neither one of us thought at that time that the oxygenate standard would be hijacked by the oil companies and used for MTBE.

But now we have seen, just as the oil companies polluted us before with xylene and toluene and benzene, and we got them to take that out, now they have replaced that witch's brew with MTBE and now we have got a lot of contaminated water that we have got to clean up in this country. Let's not make that mistake again. So I am very interested in Senator Daschle's proposal. Again, if it

means that we are going to produce more ethanol in this country and more bio-based fuels, then we are better off for it.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Harkin.

Senator Daschle.

STATEMENT OF HON. THOMAS A. DASCHLE, A U.S. SENATOR FROM SOUTH DAKOTA

Senator DASCHLE. Well, thank you very much, Mr. Chairman. Let me applaud both of you for excellent opening statements. As you said, Mr. Chairman, earlier there is a good deal of wisdom when it comes to energy and security policy right here in the Agriculture Committee, and I think your leadership and your eloquence has demonstrated that again this morning.

I can recall, Senator Harkin, a hearing that we held about 10-years ago where we were debating ETBE and MTBE, and we were warning even back then about the implications of dependence upon MTBE. And you had two samples; you had an ethanol sample and an MTBE sample. You drank some of that ethanol that day and walked out of the room in a straight line. I was really impressed. But you dared everybody to even smell, much less taste, that MTBE and nobody would.

Senator HARKIN. That is right.

Senator DASCHLE. And the point you made is so well taken today again that we are still fighting that battle. We all knew back then that it was going to be a serious problem, and it has now unfortunately come to fruition.

Mr. Chairman, I really appreciate your interest in exploring how resolution of this MTBE water contamination problem will affect the Nation's gasoline market and the future use of renewable fuels, and I applaud you for inviting so many excellent witnesses. Especially, I want to welcome Trevor Guthmiller, who is a very special friend and has been a leader on this issue for a long, long time, from Sioux Falls, South Dakota.

I think this debate will have consequences for our Nation's farmers and our rural economy, in addition to, as the ambassador said, those concerned about especially our national security as we look to the future. Most observers agree that MTBE use will decline substantially or disappear altogether in the near term. As a result, Congress must now decide whether to allow the market to replace that MTBE volume with imported oil or enact policies that will ensure that it is replaced with domestic renewable ethanol.

Ethanol advocates meanwhile face a strategic decision about how best to respond to this market opportunity. Should they oppose any weakening of the oxygen standard and try to capture the MTBE market nationwide, or should they accept a renewable fuels standard that ensures long-term, predictable growth of the ethanol industry in exchange for allowing States to waive the RFG requirement? I favor the latter approach and I want to take just a moment to explain why.

The MTBE crisis has left the RFG oxygen requirement open to legislative attack. One only has to consider these factors: California refiners have shown that clean-burning gasoline can now be pro-

duced without oxygen. EPA's Blue Ribbon Panel has recommended the oxygen requirement be repealed.

The RFG oxygen requirement is opposed by a diverse coalition that includes the American Lung Association, the American Petroleum Institute, the New England States Coordinated Air Use Management Agency, the State of California, and the National Resources Defense Council. Moreover, support for the oxygen requirement is guaranteed to weaken even more over time.

As emissions control technology of automobiles improves, the air quality benefits of oxygen in gasoline are declining, and the justification for the RFG oxygen requirement is consequently diminishing. Given this reality, our choice between defending the oxygen requirement in the near term, realizing that its days are ultimately numbered, or using the need to get MTBE out of groundwater to leverage a long-term solution that guarantees the future growth of the ethanol industry, in my view, is a simple answer.

In my judgment, a renewable fuels standard is the most effective way to put both the ethanol industry on a steady growth path well into the future and protect the clean air gains of the RFG program. I know some within the ethanol industry advocate banning MTBE and defending the oxygen requirement to the death. That option unquestionably has appeal. It would create a huge new ethanol demand in RFG areas.

It is unlikely, however, that Congress will enact such a bill, particularly since rising gas prices have sensitized Members to the need to avoid any further disruptions in the gasoline market. Moreover, this course presents the very real risk of precipitating a backlash against ethanol should supply shortages occur due to drought or other uncontrollable circumstances.

In that event, ethanol opponents will seize on the public outrage at supply disruptions and higher prices, blame ethanol as the culprit and dismantle the program. One only need envision a repeat of the 1996 drought-induced ethanol shortfall in an environment where ethanol is the sole oxygenate in a nationwide RFG program to appreciate the potential downside of this approach.

I support a plan that directs EPA to regulate MTBE, allows States to opt out of the oxygen requirement, preserves existing air quality benefits, and establishes a nationwide renewable fuels requirement. This approach would ensure not only a steady growth of ethanol over the next decade, but would also allow successful RFG areas like Chicago and Milwaukee to remain in the oxygen program.

Gradually increasing the use of ethanol in the near term through the establishment of a renewable fuels standard would facilitate a smooth transition from MTBE to ethanol, spreading its use over the entire gasoline pool through a credit trading system, and avoiding price spikes and disruption of the gasoline market. This approach would provide a solid foundation for ethanol by shifting from its declining value as an oxygenate to its value as a domestic renewable resource that will reduce our dependence on foreign oil and boost farm income. Finally, it will encourage the use of biodiesel fuel and biomass-based ethanol, which could play prominent roles in America's future fuels markets.

There is a bipartisan precedent for the establishment of a renewable fuels standard. Our colleagues, Senator Harkin and Senator Grassley, have both been articulate supporters of a renewable fuels standard for their home State of Iowa, as has another witness here today, Governor Tom Vilsack.

Governor Mike Johanns has also been a strong advocate of a renewable fuels standard in Nebraska. The Minnesota experience, where every gallon of gasoline contains renewable ethanol, has proven beyond a shadow of a doubt that a renewable fuels standard benefits consumers, the environment, farmers, the economy, and after the ambassador's testimony I would say cheap hawks.

I hope the members of this committee will join me in carefully considering this approach. It is designed to complement the Chairman's biofuels legislation, of which I am proud to be a cosponsor. It will substantially expand the existing corn ethanol industry over the next decade, while fostering development of a biomass ethanol industry at the same time.

Again, Mr. Chairman, I thank you.

The CHAIRMAN. Well, thank you very much, Senator Daschle, for your leadership and for that very strong statement.

The panel now before us includes Governor Vilsack of Iowa; Keith Collins, Chief Economist of the USDA; Robert Perciasepe, who is the Assistant Administrator of Air and Radiation of the U.S. Environmental Protection Agency; and Mark Mazur, Director of the Office of Policy of the U.S. Department of Energy.

I am going to call upon Governor Vilsack to give his testimony because he has urgent time requirements which we certainly understand. We are grateful to have you, Governor, and honored to have you here today.

I will ask each of you to try to summarize within 5-minutes, but a little bit over if you cannot make that, because we want to hear your testimony. We also want to have time for questions and back-and-forth.

Governor Vilsack.

STATEMENT OF HON. THOMAS VILSACK, GOVERNOR, STATE OF IOWA, AND CHAIRMAN, GOVERNORS' ETHANOL COALITION

Governor VILSACK. Thank you very much, Mr. Chair. Good morning to you and to the Members of the Committee. I certainly appreciate the opportunity to testify about the future role of ethanol in the Nation's RFG program.

Today's record high gasoline prices and record low commodity prices underscore the need for expanded production and use of ethanol. Just as importantly, ethanol is the solution to many of the environmental concerns which have been discussed this morning.

I am here also as Chair of the Governors' Ethanol Coalition, a group of 24 governors who support the increased production and use of ethanol, which would decrease the Nation's reliance on imported energy and create a cleaner environment.

Let me also say that as Governor of Iowa, the number one corn-producing State in the Nation, I am a strong believer in ethanol. I have seen firsthand the positive impact ethanol has had on local communities and the environment. In Iowa, we have worked diligently to develop ethanol production capacity because ethanol pro-

duction provides new markets for agricultural products and adds value to those products through processing.

We also recognize that processing is an opportunity for farmers to stay in business. With today's low commodity prices, there is little profit in production agriculture, but there is profit and opportunity in processing. By allowing producers the opportunity to get involved in value-added processing, our farmers and rural communities will benefit.

In Iowa, as Senator Harkin well knows, and as Senator Grassley knows, we have a strong commitment to protecting and enhancing our natural resources. Balancing the needs of an agricultural economy with environmental sustainability is a continuous responsibility that we take very seriously. We believe ethanol serves as a bridge between those two goals.

I am here today to say that ethanol's benefits to the economy and the environment are clear, and we must continue to advocate ethanol's role as a clean-burning fuel in the RFG program. The RFG program, with the oxygen requirement, has resulted in air quality gains beyond the emission reduction goals in the Clean Air Act of 1990. According to EPA, the emissions reduced from the use of RFG are the equivalent of taking 16-million cars off the road each year.

As the Committee knows, there are two oxygenates which are widely used today—MTBE and renewable ethanol. We now know that MTBE poses serious environmental risks. Even in Iowa, where we are not required to use RFG and where MTBE is not currently used or sold, the Iowa Department of Natural Resources recently found that 29-percent of tested groundwater samples exceeded the U.S. Environmental Protection Agency's health advisory level of 20 parts per billion.

Oxygenates such as ethanol are added to gasoline to reduce harmful exhaust emissions and improve air quality. In January, the California Environmental Policy Council unanimously approved reports finding that the use of ethanol as a replacement for MTBE would provide no negative impact on air quality, water quality, or public health. This report is similar to a report that the Governors' Ethanol Coalition issued, a report entitled "The Fate and Transport of Ethanol-Blended Gasoline in the Environment," which confirmed that ethanol is a safe, naturally-occurring substance that rapidly biodegrades and poses no threat to groundwater or surface water.

In light of high gasoline prices, it is interesting to point out that the California Energy Commission determined that a phase-out of MTBE use and ethanol-blended fuel represents the least-cost option, and less costly than the use of fuels containing no oxygenates.

Last fall, Governor Graves, who was then Chair of the Governor's Coalition, and I signed a letter to Senator Daschle commenting on his proposed legislation to address the MTBE water contamination problem that would have imposed a blanket repeal of the oxygen standard. In that letter, we endorsed the linkage of complementing the minimum oxygen standard with a renewable fuels standard for the Nation as a means of providing selective flexibility to certain areas such as California that have been particularly impacted by MTBE water contamination. We are pleased that Senator Daschle was open to our suggestion.

Just last month, I issued a press release applauding the announcement of the administration's principles addressing the MTBE problem. While I am encouraged by the EPA's decision to phase out MTBE, I also believe that it is imperative that a statutory requirement also be put in place that a percentage of all motor fuels be made from environmentally-friendly ethanol. I believe that the renewable fuels standard meets this test and would provide the ethanol industry and our hard-pressed farmers with a sustainable growth environment for years to come.

In conclusion, I just want to comment, Mr. Chair, that just a few weeks ago the Governor's Ethanol Coalition released a report of current and future ethanol production, responding to the concerns that we may not have sufficient capacity to meet the demand. This report, "The Ability of the U.S. Ethanol Industry to Replace MTBE," concludes that the U.S. ethanol industry does, in fact, have the ability to double its capacity within 2-years and to produce 3.5-billion-gallons a year by the year 2004. This would result in an excess supply of over 300-million gallons. I would like to offer this report, with the Chair's permission, for the Committee to review.

The Nation's 58 ethanol plants, located in 19 States, are well prepared to meet the immediate demand for the oxygen replacement to MTBE. This increased capacity of ethanol production will result from improved production efficiency, expansion of existing facilities, new construction underway, and proposed facilities.

Let me point out just briefly the economic benefits that will result from expanded ethanol use. 47,000 new jobs will be created across this Nation 2,300 jobs in transportation, 1,300 jobs in construction, 3,200 jobs in the retail sector, 11,000 jobs in service industries. This study projects that the industry's expansion will result in an additional $11.7 billion to real GDP by 2004, and increased household income of $2.5 billion. A recent letter from U.S. Secretary of Agriculture Dan Glickman to Senator Harkin demonstrates that we not only have the capacity to produce the ethanol, we also have the ability to transport it to the market.

Given these facts, and in light of the vast economic and environmental repercussions associated with the issue, I support and recommend that the following principles be considered by this committee and the Nation as a whole: a nationwide phase-out of the use of MTBE as a fuel additive within the next 3-years; a requirement that fuel-dispensing systems be clearly labeled if MTBE is sold through those dispensers; support for research and remediation of groundwater contamination; a continuation of the oxygen standard; prevention of any reversal of emissions reductions gained thus far through the RFG program; the establishment of regulations providing at least a .5-pound credit for reduction in carbon monoxide emissions realized from a 10-percent blend of ethanol in the Phase II RFG; and encouragement of the production and use of renewable fuels as an octane enhancer and as a replacement fuel for gasoline.

Thank you, Mr. Chair.

The CHAIRMAN. Thank you very much, Governor Vilsack, for your leadership and for your testimony this morning.

[The prepared statement of Governor Vilsack can be found in the appendix on page 75.]

Mr. Collins.

Mr. COLLINS. Mr. Chairman, Mr. Perciasepe has the most general statement among the administration witnesses, and perhaps an organizing statement, and I wonder if we might let him go first.

The CHAIRMAN. We will be happy to yield to the gentleman.

STATEMENT OF ROBERT PERCIASEPE, ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC.

Mr. PERCIASEPE. Thank you, Mr. Chairman. My name is Bob Perciasepe, Assistant Administrator at the Environmental Protection Agency. I guess one credential I will mention that I very rarely mention when I am in front of an agriculture committee is I am the first and probably the only Assistant Administrator for Air at EPA that will ever have graduated from an agricultural college.

The CHAIRMAN. That is very commendable.

Mr. PERCIASEPE. I would like to take this opportunity and appreciate the invitation to talk a little bit about the administration's recent announcements and recommendations on reducing or eliminating the use of MTBE and boosting the use of alternatives like ethanol that pose less threat to groundwater.

The objectives we have are to protect drinking water, to preserve the clean benefits, and to promote greater production of renewable fuels. And, again, I am, I think, repeating what has been said already several times this morning. Last month, when Administrator Browner and Secretary Glickman announced these principles, they laid out that kind of a strategic approach that we felt was appropriate, and I will just mention briefly what those three principles were.

First, Congress should amend the Clean Air Act to provide the authority to reduce or eliminate MTBE. I think it has been mentioned before, but I will clarify from our perspective that the Clean Air Act is not elegantly designed to be able to deal with this situation the way it is currently written, and so we think legislative action is needed to do that, and it is needed for all the reasons we have already mentioned.

Second, as MTBE is reduced or eliminated, we must ensure that the clean air gains that we have made are preserved, and this means the toxic emissions, the ozone precursors like volatile organic compounds and nitrogen oxides and carbon monoxide, again, which all have already been mentioned.

And, third, we feel that the oxygenate requirement in the current law will be a constraining factor in developing these other alternatives, and that we ought to replace it with a renewable fuel standard. And the objective there is again similar to what has already been mentioned many times, to increase farm income, create jobs in rural America, improve our energy security—and I don't think we have had a more direct summation of that issue than we did from the previous witness—and to protect the environment.

We do need to start with a little bit of history on the Reformulated Gasoline Program, and I would just like to reiterate its current successes. It has been successful in improving air quality in many cities across the country. It has been successful in achieving the goals that Congress set out for it, including air quality, en-

hanced energy security, and the use of oxygenates and renewable fuels.

It has reduced ozone levels in cities that it is used, but we still have ozone problems in the United States. So we can't turn ourselves away from the air quality needs that we have as we look at the solution to these problems. We still have 30-areas in the United States that don't meet the one-hour standard, and you know there is a continuing debate on whether or not even that ozone level is the proper one. The health effects we are talking about are respiratory infections, lung inflammation, respiratory diseases such as asthma, and decreased lung function.

The oxygenate program and the RFG program, where it has been used in the United States, has reduced in the first phase which started in 1995, volatile organic compounds and toxics by 17-percent and nitrogen oxides by 1 ½ percent. The second phase that has been mentioned which starts this summer will reduce VOCs, or volatile organic compounds, by 27-percent and toxics by 22-percent and nitrogen oxides 7-percent.

I will add as a little editorial comment to those requirements that in most cities those levels are being bettered by the use of reformulated gasoline. And as the governor mentioned, that is the equivalent to about 16 million cars of the road. Seventeen States and the District of Columbia utilize this strategy to help them in their clean air plans.

As has also been mentioned, about 87-percent, 85- to 87-percent of this reformulated gasoline in the United States uses MTBE, or methyl tertiary butyl ether, as the oxygenate of choice. And that brings us to the concern that I think Senator Harkin's bottle brought home, and that is that despite these air quality improvements which are not insignificant, there is widespread concern about the contamination to groundwater. Evidence shows from the U.S. Geological Survey, 21-percent of the samples taken in areas that use RFG. We find MTBE in only 2-percent in the non-RFG areas. So, clearly, it is linked.

As mentioned, the Blue Ribbon Panel that EPA set up in which USDA and the Department of Energy cooperated and worked with us—that Panel recommended many of the same things that are being discussed here this morning: flexibility on RFG with the oxygenated standard, reducing the use of MTBE, and improving our remediation of leaking tanks.

We are doing other things that the Blue Ribbon Panel recommended in the area of reformulated gasoline and leaking tanks. One is we are developing new drinking water standards. We are developing water quality standards. We are improving the compliance with our underground storage tank program. We are working with the University of California to evaluate leak detection technologies, and we are doing demonstration projects on new remediation techniques.

I will just close by saying that these legislative principles I mentioned earlier, which we will talk about in a little more detail here with some more information, are designed to achieve these objectives in the least-cost way. You have to look at them together as a package in order to achieve all the goals that we set out to achieve in 1990, but to achieve them in a more flexible way for gas-

oline prices and in a more effective way for promoting renewable fuels and energy security. So looking at them together as a package is what we present and want to work with Congress on.

So thank you for that opening comment and I will yield to my colleagues.

The CHAIRMAN. Thank you very much.

[The prepared statement of Mr. Perciasepe can be found in the appendix on page 82.]

Mr. Collins.

STATEMENT OF KEITH COLLINS, CHIEF ECONOMIST, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC.

Mr. COLLINS. Mr. Chairman, Senator Harkin and Daschle, thank you for the opportunity to participate today in this hearing on MTBE, renewable fuels, and related issues.

Following on Mr. Perciasepe's overview of why MTBE should be phased down and how, I want to use my couple of minutes to describe the important role of biofuels, principally ethanol, for U.S. agriculture, and why today's farmers, the administration, and many others want to see an expanded role for biofuels and bioenergy in the future.

We have witnessed recently that a very tight energy market can impose a substantial financial burden on U.S. farmers as they face increased production expenses. But it also underscores a growing opportunity that farmers have as producers of renewable fuels. Production of ethanol, and ethanol being the primary renewable fuel today, rose from a few million gallons in the late 1970s to 1.5 billion gallons produced in 1999. With low corn prices and high oil prices, ethanol production has been setting new record highs this winter. The most recent data for February shows ethanol production at a record high 108,000 barrels per day.

Ethanol has grown for several reasons. One reason is that its production costs have declined over time, and they have declined quite substantially, and that has generated commercial investment. It is also, as mentioned, an important source of oxygen for the winter time oxy-fuels program and Reformulated Gasoline Program. And ethanol is in demand as well as an octane enhancer.

Today, corn accounts for about 90-percent of ethanol production, but there are other feedstocks used as well—wheat, sorghum, for example, and starch-and sugar-containing wastes as well. This year, we expect that corn used in ethanol production will total about 550-million bushels. And if you look back over the 1990s, what we have seen is that corn used in ethanol production grew at an annual average rate of about 5-percent, and that is substantially faster than the rate of growth of corn exports or corn used in domestic feed use for livestock over the 1990s.

We have estimated how ethanol production affects U.S. farmers, and we have done that simply assuming no corn use in ethanol and putting that into our economic models for several years to see what happens to prices, farm income, and variables like that.

Without corn ethanol production, corn cash receipts would be about $2.5 billion lower. U.S. net farm income would be about $1.3 billion lower over a 7-year analysis period that we looked at. We would also have lower farm exports, and we would also have higher

imported oil costs and that would contribute about $1 billion to the trade deficit.

Now, these effects, I think, indicate the important role that ethanol plays today in supporting the farm economy, and it is one of the reasons why on February 2nd Secretary Glickman announced a biofuels program that we will put in place this year to help support increased ethanol production capacity expansion in the United States using Commodity Credit Corporation financing.

Because of such benefits, there is great interest within agriculture in the role of ethanol as a replacement for MTBE, and we at USDA have looked at the question, assuming that MTBE is phased out by the year 2004 and that ethanol would replace the oxygen now supplied by MTBE in reformulated and oxygenated gasoline.

The impacts for agriculture of that kind of an event are very similar to the ones that I just described for having no ethanol at all because we estimated that by 2004, ethanol production would have to about double to replace the oxygen in MTBE. Therefore, you get very similar effects as the absence of ethanol, farm income rising $1 billion a year, on average, over time, and that is primarily due to an annual average increase in corn prices that we would project over the first decade of this century of about 15-cents per bushel. There would also be positive trade balance and rural employment effects.

We have also completed some limited analysis of the effects of waiving the 2-percent oxygenate requirement in reformulated gasoline and replacing it with a national average renewable fuel standard. The results of that analysis indicate that an appropriately specified renewable fuels standard could provide the same or greater economic benefits to agriculture in rural areas as a phase-out of MTBE with no waiver of the oxygenate requirement.

I want to conclude by saying that the administration has a great interest in maintaining and increasing the role of renewable fuels and bioenergy for reasons for economics, energy security, and key environmental effects. Your bill, Mr. Chairman, S. 935, the National Sustainable Fuels and Chemicals Act of 1999, and the President's Executive Order 13134 on developing bio-based products and bioenergy, provide the goals and the guidance to Federal agencies to improve research, cooperation and coordination.

And I think today on the research side, particularly under the combined leadership of the Department of Energy and USDA, Federal agencies are working better than ever to help achieve a bright future for cleaner air, cleaner water, and an efficient and sustainable supply of energy.

Thank you.

The CHAIRMAN. Thank you very much, Mr. Collins.

[The prepared statement of Mr. Collins can be found in the appendix on page 89.]

Dr. Mazur.

STATEMENT OF MARK J. MAZUR, DIRECTOR, OFFICE OF POLICY, U.S. DEPARTMENT OF ENERGY, WASHINGTON, DC.

Mr. MAZUR. Mr. Chairman, members of the Committee, I am pleased to be here today to discuss the role oxygenates like methyl

tertiate butyl ether and ethanol play in the production and supply of gasoline, and how possible reductions in the use of MTBE and other changes in the Federal Reformulated Gasoline Program might affect the use of ethanol.

I want to start off by highlighting the Department of Energy's analytical focus on topics related to motor fuels. The Department has done a series of detailed analyses of the costs and refinery operational impacts of various product quality regulations, as well as looked at broader fuel supply and pricing issues. The Policy Office, where I work within the Department, has maintained a focus on how the various proposals will affect the American consumer, sometimes an overlooked stakeholder in the policy development process.

Our work indicates that the Federal Reformulated Gasoline Program has been an air quality success, with very few negative impacts on gasoline markets or consumers. There have been adequate supplies for RFG and its price has been generally only slightly higher than that for conventional gasoline.

Moreover, oxygenates also provide important energy security benefits by increasing the gasoline supply and bringing non-petroleum and renewable feedstocks into the overall mix of refinery inputs. To the extent these oxygenates come from non-petroleum and domestic sources—and a large majority of oxygenates that we do use now come from domestic sources—they have the added benefit of displacing imported petroleum and refined product.

We share the concerns of many over the water quality impacts of MTBE, and the administration has put forward a set of legislative principles that my colleague, Bob Perciasepe, went over. The key recommendations are to gradually phase down or eliminate MTBE use in gasoline, ensure that air quality gains are not diminished, and replace the reformulated gasoline oxygenate requirement with a renewable fuel standard for all gasoline.

As we work together to develop the details of our program to reduce MTBE use and increase the use of renewables, it will be of utmost importance that we move deliberately and carefully so that we do not create gasoline supplier price problems or other unintended consequences. As you know, we are operating in a tight gasoline market this summer, and projections indicate it is likely that motor fuel supply and demand balance in the foreseeable future will also be somewhat tight.

It is in this context that we must find a way to reduce or eliminate over 280,000 barrels a day of MTBE use. That is equivalent to about 400,000 barrels a day of gasoline, due to the variable characteristics of MTBE. It is a large volume, basically the output of four or five large refineries. To accommodate these changes will require substantial additional investment in refineries and ethanol production capacity.

We want to work with Congress to develop legislation consistent with the administration's legislative principles. A well-measured approach will give us the best chance of preserving a reliable gasoline supply, avoiding price volatility, and maximize the opportunity for biomass-based ethanol to participate in market growth. Given enough time, the fuels market can respond to the loss of MTBE, and clearly increased use of ethanol will play a key role.

As you know, the major renewable fuel used in this country today is ethanol from the starchy parts of corn kernels. Corn ethanol production is approximately 1.5 billion gallons a year, representing about 1-percent of the energy of our annual gasoline consumption. To complement this production, the Department of Energy is engaged in a long-range research program to develop ethanol derived from cellulosic matter, including agricultural and forest residues, the organic components of municipal solid waste, and future energy crops such as fast-growing grasses and trees.

The cost of producing cellulosic ethanol is getting close to the cost of producing corn ethanol, and Ambassador Woolsey went through that in some detail. The Department of Energy's biofuels program focuses its research and development at lowering further the production costs of cellulosic ethanol so that a major transportation biofuel industry can be established.

The Department's transportation biofuels budget request for fiscal year 2001 is $54 million. That is a substantial increase over the fiscal year 2000 appropriation. This request includes stepped-up R&D to develop cost-effective technology for breaking down cellulose into simple sugars which could be used to manufacture ethanol and other higher-value chemicals. We appreciate your support for this program.

From this developing cellulosic ethanol technology, we could see a significant growth in production of ethanol from this source on the order of 1 billion gallons a year by 2010 if there is a reliable market for ethanol. We believe it is fairly clear that overall ethanol use could increase several-fold by 2010, depending on the circumstances. Surely, there is room for expansion of ethanol production, and the Department's efforts are intended to ensure that cellulosic ethanol is part of the mix.

Let me summarize by noting that MTBE getting into water supplies represents a serious problem that we propose addressing through the administration's legislative principles. We want to work with Congress to develop legislation that fully addresses these water quality problems, while protecting American motorists from unnecessary price increases for gasoline, unnecessary price volatility, and also providing the best opportunity for growth in biomass-based ethanol production.

Thank you for the opportunity to present this testimony today.

The CHAIRMAN. Thank you very much, Dr. Mazur.

[The prepared statement of Mr. Mazur can be found in the appendix on page 101.]

Senator Daschle, do you have questions for the witnesses?

Senator DASCHLE. Well, thank you, Mr. Chairman. Let me just commend all of our witnesses for excellent statements.

Governor quittVilsack, welcome. You had indicated in your testimony that the Governors' Ethanol Coalition had endorsed the elements of the bill that we have now drafted, and that included, of course, the renewable fuels standard. That letter was written about a year ago, is that correct?

Governor VILSACK. That is correct.

Senator DASCHLE. Is that still the position of the Governors' Ethanol Coalition today?

Governor VILSACK. We are anxious to support anything that will enhance opportunities for ethanol production in this country. The renewable fuels standard is a way of doing that.

I would say that we would hope that the standard would be one that could expand over time. If you have a specific percentage where you define just a certain percentage without any expansion, then basically you define the market. We believe this market has extraordinary potential from an economic standpoint as well as environmental standpoint. So we would hope that as Congress considers this and as the administration looks at it that the standard is one where there is the goal to increase over time as opposed to a fixed percentage.

Senator DASCHLE. Thank you.

Mr. Perciasepe, I would like to just ask, if I could, the schedule is, of course, unclear with regard to your consideration of the California waiver application. But assuming that you make some decision, and it could even be this summer, is it your expectation that there are other parts of the country that could follow in the footsteps of California and apply for a waiver as well?

I have heard that, for example, the Northeast may be looking at it, and I have heard that Missouri specifically has asked to be completely relieved from its responsibilities of the RFG oxygen requirement. What is your observation with regard to the precedent-setting nature of the California waiver application?

Mr. PERCIASEPE. Well, California is in somewhat of a unique position, in that it is a very contained petroleum, or at least refined petroleum product market. They have some leeway under the Clean Air Act on their own fuel, since they in many ways were ahead of the Federal Government.

But the issues revolving around the oxygenate waiver, as it is laid out in the Clean Air Act, specifically say that a governor can ask for a waiver from the oxygenate requirement if it can be demonstrated that it is interfering with their attainment of a national ambient air quality standard. And you have to understand this is a pretty side angle in to trying to solve an MTBE groundwater problem, but nonetheless the States find themselves in this very difficult dilemma, including the Northeast.

We have had specific requests from States like New Hampshire, Governor Shaheen asking for some relief from the RFG program. Missouri recently in their St. Louis plan—and I would say that that is also East St. Louis, in Illinois, as well, although I don't think they have made any specific request, but that whole area has got a unified air quality plan.

So we would expect, depending on how the analysis goes on whether or not oxygenates in the California situation interfere with ambient air quality standards, that other States will look at it. It will be different in the other States, and so it is hard to predict specifically, but we have standing requests. We would expect more, and I think it does point out, if I can use this word, the volatility of the situation with the oxygenate requirement and how it is being perceived out in the world where governors have to meet air quality goals that they have set for their cities.

Senator DASCHLE. And what will happen in California, barring any kind of action by the Congress, if a waiver is granted? What

would be your expectation about the fuel supply and how it might be characterized following the granting of that waiver application?

Mr. PERCIASEPE. In California?

Senator DASCHLE. Yes.

Mr. PERCIASEPE. Well, the Governor of California, I think the Committee probably knows, has issued an executive order to eliminate MTBE from gasoline in California by January 1, 2003, depending on what side of the new year you are going to be on there.

In order to do that, the governor's request says that the oxygenate requirement is constraining right. Now and he can't get the MTBE out in that time frame with the oxygenate requirement for parts of California, which would be San Diego, the Los Angeles area and the Sacramento area. So he would like to move more quickly. The refiners have indicated their desire to move more quickly as well.

Senator DASCHLE. But, in short, from your technical experience, I think one could say, could they not, that there is no obvious reason why the refiners in California, if the oxygenate requirement is eliminated, would be required to use ethanol for any reason because there isn't any oxygenate requirement involving MTBE or any alternative? Is that not correct?

Mr. PERCIASEPE. If the oxygenate requirement is eliminated or modified in any way due to this request, obviously that would be the case. You know, I think most observers feel some ethanol would be used, for some of the reasons that have been laid out, including octane and volume. But there would be no requirement.

Senator DASCHLE. Mr. Collins, I will just finish with this question. I appreciate the statement made by the governor about the certainty of ethanol supply. To what extent do disruptions in production of corn and biofuels today cause a concern about that supply for the Department of Agriculture? To what extent do we have to be concerned about drought and about loss of production, for whatever reason, as we continue to try to meet the demands of the ethanol market?

Mr. COLLINS. Well, Mr. Daschle, I think it is a concern because you could look back at 1996 when we saw corn prices go to over $5 a bushel and we saw many ethanol plants shut down over the summertime. And if, in fact, ethanol were to be required because of a 2-percent requirement or a renewable fuels standard, certainly that could mean some very high corn prices and ethanol prices for refiners.

On the other hand, I would point out that we have looked, for example, at the variability of corn prices versus crude oil prices, and the coefficients of variation, a measure of variability, are about the same. So there is nothing necessarily inherently more unstable about corn as a source of supply for energy than there is for crude oil.

So, on one hand I am concerned about it because of the experience of 1996. On the other hand, I don't know that it imparts any increased volatility to the Nation's energy supply should we would move in a greater direction toward renewable fuels.

Senator DASCHLE. Thank you, witnesses. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Daschle.

Senator Harkin.

Senator HARKIN. Thank you, Mr. Chairman, and I again appreciate all the testimony.

I especially appreciate the leadership that you have shown, Governor Vilsack, in this whole area of ethanol and clean air and renewable fuels. The only point that I would like to cover with you before I get into this California waiver bit is the practicality of building more ethanol production plants and how those are going to be accomplished.

We see more and more efforts, like the one in Benton County, of farmer cooperatives, building these plants, which is going to return actually more money to the farmers in that locality. And if you could just maybe for the benefit of the record and the audience just talk about what you see as a vision for our State and other States where we can both provide for energy security in this country, but also provide for economic benefits.

I guess why I am asking is because we hear a lot of talk that, oh, well, this ethanol thing is just to benefit one company, the biggest ethanol producer in America. Yet, as you pointed out, one-third of ethanol production is now, I think, in smaller cooperative plants. What is the future for that, as you see it, for our State and other States?

Governor VILSACK. Well, Senator, thank you for the question, and I appreciate the kind comments about my leadership. I am simply following your lead.

First of all, in terms of supply it is fairly clear that the current ethanol production facilities are not producing as much ethanol as they are capable of producing. They can be run more efficiently, which would result in immediate additional supplies.

second, existing plants can be extended and expanded quite quickly, within 12- to 18-months, because of the modular nature of the construction of these facilities. And there are currently plans underway that would expand significantly above and beyond that in a relatively short period of time. So we are in a position to be able to double capacity within 3- to 4-years to meet the demand if MTBE is phased out.

How that is done—I think you will begin to see a greater opportunity made for ordinary family farmers to band together in cooperatives, and they in turn will own these processing facilities. You mentioned a third of the processing capacity today is farmer-owned. I think you will see a continuing enhancement of that.

In our State, for example, we are making opportunities available through an ag-financed corporation, an entity available to provide loans and credit to farmers to become equity owners in these processing facilities. I think it is fairly clear that our agricultural policy has to recognize the importance of giving farmers that kind of opportunity to profit not just from production but also processing.

I would also suggest to you that there are great opportunities with biomass, in addition to corn. Even in our own State, as you know, and under your leadership, there is a particular emphasis on this in the south central part of Iowa. I am excited about the fact that ethanol can be made from virtually anything, and I think we don't want to lose sight of that as we deal with the issues that Senator Daschle raised about supply. The reality is it isn't necessarily

exclusively produced from corn. It can be produced from rice, it can be produced from waste paper products, it can be produced from municipal waste. The opportunities are enormous.

Senator HARKIN. Thank you very much, Governor, and I would just go from that again to Mr. Collins. I did this work day at the Benton County facility, Sunrise Cooperative, where they have just come on line with their ethanol production last fall. They seem to be doing quite well. They are feeding the wet milling to cattle and they are contract-feeding cattle from all over the Midwest now.

I mentioned to them that the administration had proposed, out CCC authority, that this year there be at least $100 million in grants to ethanol plants that would increase their production over some baseline. Next year, that is supposed to be $150 million, and then $150 million the year after that.

You mentioned in your testimony about promulgating this rule. We are anxious. When do you think you will have that rule out? Furthermore, will that money be focused on the kinds of plants that Governor Vilsack was just talking about, the kinds of cooperatively-owned plants that can ramp up their production with this kind of assistance? Is that how you are focusing the money?

Mr. COLLINS. Mr. Harkin, let me say a couple of things about this. The Secretary proposed this and the administration has provided for this funding as part of the administration's farm safety net package to support agriculture at a time of low prices.

We are in the process of drafting that proposed rule right now. It is our desire to use that to expand economically achievable, economically feasible production. That means that there is going to be somewhat of a more narrow range, perhaps, on the kinds of agricultural commodities that could be used to produce ethanol, but it would certainly include corn and, in the case of diesel, soybeans.

We are doing this under Commodity Credit Corporation authority. There are some limitations on that with respect to targeting the eligible plants. The authority that we are using to do this is to purchase agricultural commodities to support farm income. So we are working on that right now. We are looking at different ways, and it is one of the things that has taken a little bit of time in developing this rule.

We are looking at some different ways of targeting this so that smaller operators or cooperative producers will get a higher proportion of the benefit than the very largest ethanol plants. We haven't quite figured out how to do that yet, but that is what our goal is.

Senator HARKIN. Well, I sure hope you will be talking to us about that.

Mr. COLLINS. We certainly will.

Senator HARKIN. If we need legislation and if you can't do it in a rulemaking, we had better get hot on some legislation.

Mr. COLLINS. We think there are some ways that we could do that.

Senator HARKIN. It seems to me this is the best way to ramp up production rapidly, and also provide for broader-based ethanol production and to provide for a broader-based income safety net, as you are talking about, the economic benefits of this accruing in more places than just one in the United States. I mentioned this at the plant and they were very interested in this, of course, be-

cause they can ramp up production. And with this kind of help, they could move, and a lot of these cooperatives could.

So you have no timetable on this rule? I mean, you know, this is April.

Mr. COLLINS. Yes, it is. We are working as fast as possible. I can't give you a date that we would propose that rule, but I hope it will be soon.

Senator HARKIN. Well, end of the month?

Mr. COLLINS. I can't give you that date. I am sorry.

Senator HARKIN. End of May?

Mr. COLLINS. Soon, Mr. Harkin.

Senator HARKIN. Well, I hope it is by the end of this month. Like I say, if you have any problems in the targeting, I think you should let us know and see if we need any legislative help on that.

Mr. COLLINS. Thank you for your help on that.

Senator HARKIN. Lastly, on the waiver, the California waiver, let me just say at the outset that I don't see any need for that waiver right now. I assume that comes as a surprise to a lot of people in this room.

[Laughter.]

Senator HARKIN. It is obvious that the report we got back from the GAO shows that we can ramp up production. As California phases out MTBE over the next couple of years, we can meet the demand. There is no problem with that.

Now, they were somewhat concerned about the price effect, and so we were looking at the price effect on that. Right now, according to Keith Collins at USDA, the wholesale price of ethanol now, after deducting the excise tax exemption which we will keep, thank you, is about $.70 a gallon, while the wholesale price of gasoline is $.90 to $1.00 a gallon and MTBE is $1.10 a gallon. Those are your estimates.

So, again, these prices undercut arguments about the excessive cost of replacing MTBE with ethanol. If ethanol is about $.70 a gallon and MTBE is now $1.10 a gallon—I am not talking about the contamination problems; I am just talking about economics and the cost—motorists in California and elsewhere could save money at current prices by switching to more ethanol, which is just the opposite of what we are hearing from California. They are saying, oh, my gosh, this is going to cost us all this more money.

Well, if these figures are right, then it seems to me it is not going to cost the motorists in California or anywhere else any more at all, even if you are including some transportation costs. Now, obviously, there are some transportation costs involved.

But at $.70 a gallon, compared to $1.10 a gallon for MTBE, do you see, Mr. Collins, any problem with prices in California?

Mr. COLLINS. Mr. Harkin, I do. What you have quoted are a snapshot of market prices at a point in time, and those certainly change from to time to time and they are certainly reflective of the tight energy markets we have today.

But I would point out that there have been a number of studies that have been done that have looked at the cost of producing fuel with and without an oxygenate requirement, with no MTBE, both in California and around the Nation. Most of those studies would show a higher cost for no MTBE with the oxygenate requirement

in place, compared with no oxygenate requirement. Now, the cost difference is fairly small in some studies and larger in others.

Senator HARKIN. Now, Keith explain that to me.

Mr. COLLINS. Well, I can.

Senator HARKIN. You say the studies show that the cost would be higher if we have an oxygenate rule without MTBE. I just quoted you your own figures on the cost of production.

Mr. COLLINS. You quoted market prices, but I have not done a study of refinery costs and what it takes to refine gasoline in California. I know that one study has been sponsored by the Department of Energy, done by MathPro, and perhaps Mr. Mazur would bail me out here and want to comment on that.

Mr. MAZUR. Just in general, I think Keith is right that when you quote these prices, they were taken at a snapshot in time and your price for gasoline was over $1.00 a gallon. It is somewhat less than that now at a wholesale level, and these prices move up and down.

Senator HARKIN. It is not less than $.90 a gallon.

Mr. MAZUR. In New York Harbor, it is much less than $.90 a gallon.

Senator HARKIN. Where?

Mr. MAZUR. New York Harbor.

Senator HARKIN. New York Harbor. I am talking about California.

Mr. MAZUR. I didn't look this morning at the price in California. I don't know what that is.

Senator HARKIN. OK.

Mr. MAZUR. Anyway, the study that we worked on, we had a number of people look at the operations of a typical refinery under a situation where you have MTBE allowed to be used in gasoline and where you don't, and it is a couple of cents a gallon more to replace MTBE. Generally, MTBE is a good, low-sulfur, high-octane, high-quality blendstock, and it gets replaced by ethanol, plus a somewhat differently refined product, and it tends to cost a little bit more to make that blend.

Now, Keith's point is correct that it is a couple of cents per gallon in a market where we see fluctuations like that happen pretty regularly. So it is not something that people will view as a price spike.

Senator HARKIN. That is right.

Mr. MAZUR. But the point is that there will be upward pressure, and the California market is quite tight under any circumstances and so importing additional supplies of blendstocks or ethanol will likely put upward pressure on prices.

Senator HARKIN. Well, you are the Department of Energy, Mr. Mazur, and the Department of Energy indicates that if the RFG oxygenate requirement is maintained and MTBE is replaced by ethanol, the increased cost to consumers of gasoline would be less than 1-cent a gallon.

Mr. MAZUR. Depending on how you phase that in, yes. It could be 1, 2, 3, a couple of cents a gallon, something like that.

Senator HARKIN. What if we phase it in over a 3-year period of time?

Mr. MAZUR. Phasing it in over a longer period of time is certainly better than not phasing it in.

Senator HARKIN. Well, in California that is what you have got. Well, you have got 3-years, that is right; you have got 3-years' phase-out in California. That is exactly what we are talking about, and we are talking about ramping up production, as our own studies show that we can do. We can ramp up that production to meet that need in 3-years, no problem.

Mr. MAZUR. Well, not quite no problem because there is a couple billion dollars of investment that will be needed to ramp up that production.

Senator HARKIN. That investment will be there, with some help from CCC and the need to maintain—obviously, if they need to maintain an oxygenate requirement, you see.

Mr. MAZUR. Yes, and if you look at the administration's principles, one of the things that we focused on was a requirement for a renewable fuel standard and provide some certainty to the market over time so people making these long-term investments will know that——

Senator HARKIN. Well, don't get me wrong. I am supportive of what Senator Daschle and others are doing for a renewable fuels percentage nationwide. But I am not certain I want to see that happen now without some thought on the oxygenate requirement. I would hate to do away with that right now because I don't know what that percentage is going to be. Right now, we are at 1.2-percent.

Mr. MAZUR. Approximately, right.

Senator HARKIN. Approximately. If we replace all MTBE, that gets it up to about 2.5-percent, roughly.

Mr. MAZUR. Maybe a little more.

Senator HARKIN. Well, my figures are 2.5, less than 3.

Mr. MAZUR. My figures are around 3, but that is close enough.

Senator HARKIN. To replace all MTBE. So we can do that within about a 3-year period of time, if I am not mistaken, according to the studies we have had.

Mr. MAZUR. According to the USDA study, yes, at a cost of a few billion dollars.

Senator HARKIN. And so, again, to get up to 5-percent in a few years does not seem to be out of the ball park either.

Mr. MAZUR. I think you are getting close then.

Senator HARKIN. What?

Mr. MAZUR. I think you are getting close to out of the ball park there.

Senator HARKIN. Well, 5-percent by what year? Give me a year. End of the decade? Sure.

Mr. MAZUR. As Ambassador Woolsey pointed out, if you get some breakthroughs on cellulosic ethanol technology, you can make some substantial contributions there. If those breakthroughs don't come through, it is very difficult to hit those targets.

Senator HARKIN. I am not certain about that. I mean, I am not only thinking about corn, but I am thinking about sugars and everything else that we produce in this country from which you can derive ethanol, non-cellulosic-type ethanol, starch-based.

Mr. MAZUR. At a price, you could. I think the key is getting the price of the ethanol down to competitive levels.

Senator HARKIN. I understand that, but again don't get me started on this price thing because I will get into my argument with Phil Gramm again, and that is what is the cost of gasoline? What is the cost of oil, how much a barrel does it cost?

When you figure all the subsidies we have given over the last 70-years to the oil companies—someone was talking about how much we have provided to ethanol since the early 1980s, since we had the excise tax provision. The amount of tax subsidies to ethanol is even less than what it is to the oil companies during that same period of time, not talking about going back over the last 70-years.

What did the Gulf War cost us? What does it cost us to keep our military in position to keep our oil lanes open to the Mideast? What does all that cost? We haven't factored that in. That is just sort of a freebie. Well, you start factoring that in and I am telling you, the cost of domestically-based ethanol looks very competitive.

So, again, we can all get into a discussion of market prices, but U.S. taxpayers are paying the additional cost for what it costs us to import oil from other countries. And I think if we are going to start talking about price—and I am not arguing with you, I am just making a statement—we ought to be factoring that in, too.

So I think, overall, just to sum it up, I am just saying I think we need to keep that oxygenate requirement. I see no need for a waiver because we can meet the requirements in California. It is not going to cost any more. We are going to ramp up production, and then I think we have to come underneath with a national reformulated standard for the future.

I agree with Governor Vilsack. We shouldn't set some kind of a percentage, or if you do, it ought to be minimum. If you want to set a minimum of 5-percent by the end of the decade, it may be a minimum, but it certainly shouldn't be any kind of a maximum goal that we are looking for. So I am concerned about that percentage goal.

Thank you very much. Thank you for your indulgence, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Harkin.

Mr. Collins, there is one small part of this picture, but still an important one. My understanding is that the sugar processors and growers have asked the Department of Agriculture to make open market purchases of sugar. I have written to Secretary Glickman to outline why I think that would not be a good idea and I have mentioned that these open market purchases might not necessarily prevent the loan forfeitures which are being sought as the objective. Finally, of course, dumping the sugar overseas would create real problems with our trade partners, including possible litigation.

What I am concerned about is that one proposal has been that the sugar might be purchased, and the current market price is $.19—you might be able to get it for less than that, but probably not much—and sold at least to ethanol plants for $.03 or $.04, to be used to make ethanol at the expense of about a $.15 per pound differential to taxpayers.

Already, consumers in America pay a lot for sugar, whether they realize it or not, as a hidden tax. But this would be a very visible one in which very clearly taxpayer funds would be required to do

this operation. For those reasons, I strongly protest doing this kind of thing, for whatever it means.

But I ask you specifically, have proposals been made to ethanol companies with the thought that this kind of sugar supply might be available to them cheaply? Is this a part of the administration solution to the problem right now?

Mr. COLLINS. Mr. Chairman, I know Mr. Woolsey used the Julie Andrews model, and often at USDA, using another musical, we use the line of Fagan in "Oliver," who sings "we have got that under review."

So I would say that it is not part of administration policy at this point. We have had the sugar growers come to us and ask us to purchase sugar off the open market. As you know, we have got 1.4 million-or-so tons of sugar under loan. We expect that at least 300,000 tons of that will be forfeited. We had a lock-up last night and this morning and we revised our sugar numbers this morning, and we have yet even more beet sugar production than we anticipated, another 50,000 tons. So we have prices well below the loan rate in many areas of the country, and the proposal has been, rather than wait for large forfeitures in the month of August, to purchase open-market sugar.

You have come right to the heart of the issue, and that is if you were to do this, and put aside for the moment the cost of doing it and what the effect might be on subsequent forfeitures, the question is what do you do with the sugar. Usually, when we purchase such commodities, as we did wheat last year, we use them in humanitarian assistance programs overseas. There is not a big demand for sugar in foreign countries, particularly developing countries, particularly with the world price of sugar in the $.05 to $.06 a pound range. It also doesn't seem prudent to move large volumes into the domestic feeding programs, such as the School Lunch Program or others.

So, yes, we have talked with the ethanol industry about using this sugar for ethanol. We have talked with them strictly to see if it was technologically feasible. They tell us that it is, that they could feed sugar, once the corn is broken down, into a sugar stream, they could feed this sugar in and turn it into ethanol.

They have to use refined sugar, which would probably cost us in the neighborhood of $.23 to $.24 a pound rather than the $.19 you mentioned, and they have indicated that it would be economically feasible for them to do that at a price in the $.03 to $.04 a pound range. Now, on the surface that sounds like a horrific taxpayer loss. It only looks at all attractive if you compare it to the alternative, and that is that we make a purchase and donate it overseas, for which we get nothing back. At least under this option you would get a few cents back.

But having gone through this long discussion about this, you can see that we are engaged on this issue, but we have made no decisions whatsoever at this point on how we are going to proceed, whether we are going to let forfeitures occur or whether we would do what the sugar growers have proposed to us.

And I might say that the Secretary did mention to me this morning your letter, which I think he got yesterday. I have not seen it,

but it certainly has his attention and he will pay careful attention to it, I am sure.

The CHAIRMAN. Well, I hope that he will. I appreciate the dilemma that you have suggested, but these really would be grave situations. It is not simply a humanitarian gift of the sugar. I think you understand better than most of us the ramifications in terms of foreign policy and our relationships with a raft of countries where, on the one hand, we are attempting to help, and on the other hand we are planning to devastate.

Dropping this sugar on these people is no gift, and I would just simply say that dropping it on the ethanol plants ought to excite Senator Harkin. It certainly excites me.

Mr. COLLINS. The dilemma is we are probably going to get sugar one way or another.

The CHAIRMAN. Yes, because we have a disastrous sugar policy, and hopefully this may underline the ridiculous nature of what we have been doing year after year. So I am hopeful that will be at least one good thing that comes from this fiasco.

I just listened to my colleague for several minutes trying to think through the ethanol dilemma with regard to corn and MTBE and what have you, and on the other hand sort of offstage the proposal is that we dump all this sugar on the ethanol plants at $.03 or $.04. Having lost the taxpayers' money, we have pretty well ruined the corn farmers in the process, and I just don't like that idea at all. I think you understand that, so without going into histrionics about it, I hope the Secretary does not proceed. If he does so, I think there will be consequences, and they will come from me and I suspect maybe from Senator Harkin and this committee. We just will not stand by. Even though you may have an administrative call to make, there are legislative remedies, and I think this is very, very serious.

Mr. COLLINS. I will convey your thoughts to him.

The CHAIRMAN. Thank you.

Senator Grassley, do you have any final thoughts before——

Senator GRASSLEY. You want to adjourn, don't you?

The CHAIRMAN. Not yet, no. We have another panel.

Senator GRASSLEY. Oh, you do?

The CHAIRMAN. Yes.

STATEMENT OF HON. CHARLES E. GRASSLEY, A U.S. SENATOR FROM IOWA

Senator GRASSLEY. Well, yes, I do. I want to take advantage of the opportunity to thank Governor Vilsack for his leadership in the area of ethanol, along with Senator Harkin also working hard at it. I hope I contribute something to it as well.

I want to focus on the American Petroleum Institute's opposition to what Iowa tried to do and did do last year successfully to ban MTBE, and that was that you got a letter from them arguing that the Clean Air Act preempted the rights of States to regulate MTBE. I also had a copy of that letter.

First of all, I don't agree with their narrow analysis, but even if there were restrictions, it would seem highly unlikely that neither the petroleum industry nor the EPA would dare attempt to enforce such a preemption. Because the petroleum and MTBE industries

are facing escalating multi-billion-dollar cleanup liability lawsuits, it seems to me they would be digging themselves in very much deeper if they had the chutzpa to try to block States from regulating MTBE.

Now, this is not to put you on the spot, but I just wonder do you agree and do you have any comments that you could share about the petroleum industry's response to the Iowa efforts to ban MTBE.

Governor VILSACK. Well, Senator, I guess in a word I think States need the ability and the power to protect their water supplies. When we have documented evidence that MTBE contaminates groundwater and surface water, and therefore threatens drinking water, it would be remiss on my part if I didn't exercise every power that I had as a governor to ensure the safety of our drinking water, as Governor Davis did in California.

Senator GRASSLEY. So you have to take the position that the Clean Air Act doesn't preempt the right of States to regulate MTBE, even though they said otherwise?

Governor VILSACK. It would certainly be my position that we would need as much flexibility as possible, which is why we were also supportive of the administration's efforts to phase out MTBE.

Senator GRASSLEY. I would like to suppose for a minute that the Clean Air Act does preempt States from regulating fuel components or characteristics for the purposes of controlling motor vehicle emission. Also, let's suppose that the EPA and/or the petroleum industry would have the audacity to attempt to enforce such a preemption. Then what I would propose is that the States be very specific in their regulation of MTBE and pass legislation regulating for the express purpose of protecting the States' water supplies, and only the water supplies, and not do it through the Air Act, again banning MTBE to protect the water, not to protect the air.

If I can recall from memories of promoting the Reformulated Fuels Program, when we passed the Clean Air Act we did not intend to preempt the right of States to protect their water supplies. So I can see a unique and dramatically positive role that governors can play in addressing the MTBE problem. So I hope maybe through your leadership on the Ethanol Coalition that you could provide guidance to governors throughout the United States, explaining to them that they and their legislatures, from the intent of the Reformulated Fuels Program not to preempt States from protecting their water supply, can take immediate action on their own to protect their States' water, and to do it that way.

That would then bring me to something that I have to tell our colleagues, or at least my views on something that the EPA testified to, and I would quote, "Congress should amend the Clean Air Act to provide the authority to significantly reduce or eliminate the use of MTBE. This action is necessary to protect America's drinking water supplies."

So I think that this detracts us from what we ought to be concentrating on; that the problem is not the Clean Air Act when it comes to water; that we protect our water by acting to protect our water and not detract the ability to do that by some preemption of the Clean Air Act for States to do that.

As you testified today, the Clean Air Act did not contaminate Iowa's water supply with MTBE. The oil industry uses MTBE in

conventional fuel as an octane enhancer, even though we don't have requirements under the RFG programs for our State. And it is use as an octane enhancer as much as an oxygenate requirement that contaminates water in States like Iowa that don't use reformulated gasoline. Yet, we have the petroleum and MTBE industries telling Americans that all you have to do is amend the Clean Air Act and water supplies will be safe. They won't be safe as long as MTBE is still used as an enhancer.

Second, and just as important from my Governor's testimony, he underscores the fact that States can ban MTBE on their own, and consequently there is no reason to wait for the Federal Government to take action. Yet, I think EPA tells us that that is the way it must be done.

So, Mr. Chairman, what I see that we need to do is States need to be told today that they may proceed to ban or phase out MTBE immediately. And there may be some States that want to continue to use MTBE, and then if so, Congress should not preempt the States' right to do that.

Second, EPA needs to admit to the public that if shortages of oxygenates do occur, EPA has the authority to temporarily waive the oxygenate requirements until supplies become available. Obviously, with the governor of the leading corn-growing State in the Nation saying we have the ability to produce ethanol to replace all MTBE within 2-years, I don't think we should see that as a major problem to overcome.

Unfortunately, we haven't had from Washington a clear enough signal to California about their baseless request for an oxygenate waiver. And when we don't have that clear signal, then it seems to me that we are in a position of denying markets for $1 billion worth of corn this year.

So, Mr. Chairman, you are outstanding member of the U.S. Senate and a lot of people listen to you, and particularly in agriculture they are going to listen to you. And I hope that we do not allow the distraction of amending the Clean Air Act, that that is the only way that we can clean up our water supply, because that argument lends itself to the argument of the big petroleum industry. And it lends also credence to them who do not want ethanol to fill the vacuum that is created with the outlawing of MTBE.

The CHAIRMAN. Well, the Senator makes a very good point, and you have made it eloquently. Certainly, both the Chair and I suppose our witnesses who are on the firing line really on the administration side of this have heard your call.

Are there any comments on Senator Grassley's comments?

Mr. PERCIASEPE. Well, at great risk, I will comment. My name is Bob Perciasepe from EPA. EPA is not going to stand in the way of any State that wants to ban MTBE, but we will assume the legal risks that will be involved. And we can argue forever as to whether or not the Act allows it, or the preemption does or doesn't allow it. The truth of the matter is it will be litigated.

And if you provide a clear signal to the ethanol industry on production goals and the certainty of their future product, and you want to have a clear vision of how you are going to solve the groundwater problem that now presents itself, we still feel very

strongly that the legislative approach to create that certainty is the best all-around approach to resolving the issue.

That is not to say we are not going to work with States now. It is not to say that we may not be willing to take that risk with the States, but we should recognize that there would be legal risk in making that kind of decision. But, again, I would agree with the Senator that the paramount issue of protecting groundwater and the governors' ability to do that is something that we will work with them on.

Senator GRASSLEY. My response to that, Mr. Chairman, is probably more to you than to him because this is our branch of government problem and something even Governor Vilsack can't do anything about, albeit he wants to get to the same place I want to, not a whole lot of difference. And I am trying to convince him that maybe our way is the best way.

But, anyway, it is not the end, it is how you get there, and that is that within the Congress of the United States—and I know this from the debate of the Clean Air Act of 1990, and also the ethanol tax exemption debate, and then also on Senator Boxer's resolution that she had up last year—it is very difficult to overcome the arguments of the big oil companies on this issue because they do not want to have any credibility for any product they don't control. And they don't control ethanol.

The CHAIRMAN. Well, the Senator's observation is correct. It is difficult.

Senator GRASSLEY. And hence then to the EPA, you see why we are reluctant to get this out on the legislative floor and then lose everything. They get the oxygenated requirements repealed, as you are suggesting, and we don't get the RFG enhanced mandate. And even if we get it, according to USDA economists, we are 9-years getting to the $1 billion that we would have in the farmers' pockets right now if California had to start meeting the oxygenated requirements with ethanol today at 500, 600-million gallons. A bird in the hand is worth two in the bush.

Mr. PERCIASEPE. And I understand that.

Senator GRASSLEY. OK, and at the time corn prices are at 23-year lows.

The CHAIRMAN. That is the purpose of our hearing today, and reference has been made to legislation offered by members of this committee which offer vehicles for doing the things that Senator Grassley and others have suggested.

Well, we really appreciate very much your coming and spending this time with us.

The Chair would like to call now another panel which will be made up of Mr. Trevor Guthmiller, Executive Director of the American Coalition for Ethanol, Sioux Falls, South Dakota; Mr. Nathan Kimpel, President of New Energy Corporation, South Bend, Indiana; Rus Miller, Chief Operating Officer of Arkenol, Incorporated, in Mission Viejo, California; Jason Grumet, Executive Director of the Northeast States for Coordinated Air Use Management, in Boston, Massachusetts; and David Morris, Vice President of the Institute for Local Self-Reliance, in Minneapolis, Minnesota.

Thank you for coming to the hearing today. We look forward to your testimony. We appreciate especially your patience in waiting

to this hour. As you can see, our committee hearings are ones in which you bring your breakfast and your lunch and you sort of spend the day. We are a hard-working committee.

I will call upon each of you in the order I have introduced you. First of all, Mr. Guthmiller, would you please proceed with your testimony?

STATEMENT OF TREVOR T. GUTHMILLER, EXECUTIVE DIRECTOR, AMERICAN COALITION FOR ETHANOL, SIOUX FALLS, SOUTH DAKOTA

Mr. GUTHMILLER. Thank you, Mr. Chairman. My name is Trevor Guthmiller and I am the Executive Director of the American Coalition for Ethanol and we are based out of Sioux Falls, South Dakota. ACE is a grass-roots nonprofit ethanol advocacy group, and we were formed in 1988 with membership comprised of ethanol producers, rural electric cooperatives, commodity organizations, and businesses and individuals that support increased ethanol production and use.

We greatly appreciate this opportunity to comment on the relative merits of proposals to deal with the MTBE water contamination problem, the importance of the oxygenate standard in reformulated gasoline, and the need to provide sustainable growth opportunities for ethanol over the mid-to long-range term.

Mr. Chairman, the ethanol industry has been very fortunate over the years to have had the bipartisan support of many members of Congress, including yourself. You have been one of the ethanol industry's most articulate spokesman and have effectively promoted expanded ethanol production and use since the industry's inception in the late 1970s. Ethanol's bipartisan supporters include all the members of this committee as well, both Republican and Democrat. The entire ethanol industry and America's grain producers owe you all a great deal.

In the interest of time, Mr. Chairman, I would ask that my full written testimony be submitted to the record and then I would like to briefly summarize the rest of that in the remaining few minutes.

The CHAIRMAN. Your testimony will be published in full. That will be true for each of the witnesses, and we will ask that you summarize in 5-minutes or a bit more. Witness the previous panel.

Mr. GUTHMILLER. Thank you.

To begin, Mr. Chairman, ACE believes that the Daschle-Dole-Harkin reformulated gasoline provision in the Clean Air Act Amendments of 1990 which established the minimum oxygen standard in reformulated gasoline has been a great success. With your strong support and that of many members of this committee, the Daschle-Dole provision was adopted by the Senate by an overwhelming 69–30 vote. That was 10-years ago.

The ethanol industry has grown, but we are again at a crossroads due to the problems caused by MTBE which is putting the future of the Reformulated Gasoline Program and the oxygen requirement in jeopardy. Knowing that we have a great product, we must still deal with the reality that the petroleum industry, essentially both our customer and our competitor, controls the entire fuel infrastructure our product is distributed through. And if they didn't

have to meet ethanol to meet certain fuel goals in many places, they wouldn't use it.

Cost in large aspects is irrelevant to them, since the consumer pays the final cost, regardless of what the product is, and they would much rather in many cases have the customer buy petroleum versus our product, which is ethanol. It is good for our country to require the use of fuels other than petroleum if they are able to be incorporated into our transportation infrastructure with little or not cost to the consumer. Ethanol meets that test. The question now becomes how do we best incorporate a growing ethanol industry in our national energy policy.

To answer that question, we need to look at what are the values of ethanol. First off, ethanol has value as an oxygenate. Adding ethanol to gasoline indisputably reduces automobile emissions. This has value to areas of the country where automotive emissions lead to poor air quality.

Ethanol also has value as a domestically produced renewable fuel that can be used to replace imported fossil fuel. Currently, our Government and our gasoline industry place no value on substituting a fossil fuel with a renewable fuel. With high gas prices as a result of our increasing reliance on imported oil, the time to consider charting a course that will result in the greater use of domestically produced renewable fuels like ethanol and biodiesel is now.

The decisions that the EPA and Congress will make in the next few months will potentially determine whether this industry goes forward or falls backwards. Last week, I spoke at the groundbreaking of a new ethanol plant near the small town of Wentworth, South Dakota. Approximately 975 farmers, with the help of the rural electrical cooperative, the South Dakota Corn Utilization Council, and others, invested their money in a project which will 1-day turn the corn they grow into high-value ethanol.

This investment they made was not only in that plant in Wentworth, but also in the goodwill of the United States Congress, since it was Congress that wisely created the Reformulated Gasoline Program and the requirement that oxygenated fuel be used in that program. There are many who do not understand the personal investment that thousands of family farmers have made in cooperative ethanol plants. They will say that the answer is just getting rid of the Reformulated Gasoline Program's oxygen requirements, or to allow States to opt out of the requirement, with no consideration given to the loss of markets or the potential markets to be gained. That is not the answer.

Two of my board members are family farmers from Minnesota who have essentially no connection to the ethanol industry, other than the fact that they have invested some of their family's hard-earned money in farmer-owned ethanol plants. They represent over 12,000 individual farmers in Minnesota, South Dakota, Iowa, Nebraska, and Missouri, to name only a few States that have directly invested in ethanol plants. These are the people we must remember and think about when decisions that will affect the future of the ethanol industry are made.

Let me say this as clearly as I can. Farmers did not create the problems associated with the use of MTBE, and they should not be made to pay the price for getting it out of our system. Eliminating

the oxygen requirement is not the answer; modifying it, maybe; eliminating it, no. That is not the answer because it does nothing to reduce our dependence on fossil fuels, nor does it protect the investments of farmers who have gotten together to build ethanol plants who are banking on there being a continuing market for their fuel, nor does it help to protect air quality.

In his recent speech to the National Conference on Ethanol Policy and Marketing in San Francisco, Senator Daschle stated the obvious: if it is possible, the ethanol industry would prefer that the successful Reformulated Gasoline Program with the oxygen requirement be maintained as it is, and ethanol use expanded to fill the gap left by the departure of MTBE. The outstanding success of the Reformulated Gasoline Program with ethanol in Chicago and Milwaukee provides the best evidence for this position.

However, we are also aware that there are many powerful interests who are strongly opposed to this approach and who are demanding elimination of the oxygen standard. Though we are highly skeptical of the oil industry's claims that it can produce equivalent clean gasoline without the use of ethanol or other oxygenates, there are many people who are so frustrated with MTBE that they do not want to accept the status quo.

If it proves to be impossible to hold the oxygen requirement or if it seems as though the oxygen requirement will be dismantled by the granting of waivers by the EPA, then we agree with Senator Daschle that the renewable fuels standard or some other mechanism like that must be established to ensure the sustainable growth of the ethanol industry, both traditional grain-based and emerging biomass technologies. This would protect the investments of all the farmers who have bought shares in ethanol cooperatives, while at the same time paving the way for the continued growth in the ethanol industry.

Several highlights which we believe should be part of any legislation, should that be necessary at this point, I want to just highlight. The oxygen standard, we believe, should not be eliminated. If necessary, it should be modified, but not eliminated. RFG areas like Chicago and Milwaukee, where the use of ethanol has been a huge success, should be allowed to continue with their program.

Any renewable fuels standard, if enacted, must have a strong enforcement and penalty provision, and the Secretary of Agriculture must be involved in making any decisions concerning waiver of the requirement related to concerns over potential shortages of ethanol due to drought or other extraordinary circumstances.

If enacted, a renewable fuels standard should include strong anti-backsliding language that will preserve the real-world gains made from the use of oxygenated fuels in RFG areas. To prevent refiners from increasing toxics, an aggressive cap should be imposed on the level of aromatics in gasoline.

A renewable fuels standard, if enacted, could also include credit trading mechanisms to provide flexibility to refiners and protection for consumers. If it is politically feasible to hold on to the oxygen requirement in reformulated gasoline as MTBE is eliminated from use in the country, then that is what we would prefer happen. However, if the reality is that it is not possible, we need to have our minds and our eyes open to other options.

Regardless of whether those waivers that were discussed earlier are granted—rightly or wrongly, if those waivers happen, any chance of growth in the ethanol market become severely limited. And then it is those 975 farmers whom I spoke about earlier who pooled together their own money to build an ethanol plant in Wentworth, South Dakota, who broke ground last week, who will be left without a market for their fuel. And any other farmer group out there that is looking at creating some extra income for their family through processing their corn into ethanol, including the 12 groups that met last week in Iowa, will be stopped dead in their tracks. Their projects will not move forward.

Protecting the oxygen requirement or finding some other mechanism to promoted the increased use of ethanol is vital to the future of this industry. Finding a solution is not a partisan issue. It is an agricultural issue, an economic issue, and it is a personal issue to all the farmers who have invested their money in ethanol plants. Creating value for ethanol as a renewable fuel and as an oxygenate are beneficial to our industry and our country.

The United States Department of Agriculture estimates that replacing MTBE with ethanol in reformulated gasoline areas would increase the demand for corn for ethanol use by over 500 million bushels and would increase the price of corn by $.14 per bushel, which would overall increase total farm cash receipts by $1 billion annually. On top of that, we would then double the amount of petroleum the ethanol industry is currently displacing in our country. That is what we want to happen.

Any solution to this MTBE crisis that would at least ensure the doubling of the size of the ethanol industry, protect the investments of farmers in ethanol plants, while preserving the air quality benefits achieved with the use of clean-burning oxygenated fuels, would be something we would be extremely supportive of.

Mr. Chairman, I found the words that you yourself spoke on February 24 to be very important. You were quoted as saying, "Nothing underscores America's dependence on Middle Eastern oil more than the fact that we now keep nearly 30,000 men, 13 ships, and 310 aircraft deployed in the Persian Gulf to ensure the flow of oil. If we do anything that doesn't take these soldiers ion the Middle East or these farmers in the Middle West who have invested in ethanol plants into consideration, then we are doing them all a great disservice. We must find a way to grow the ethanol industry to reduce our dependence on foreign oil, as well as to create new markets for farmers."

Mr. Chairman, our membership commends you for convening this important hearing and thanks you for your longtime support for the ethanol industry. We urge you and your colleagues to continue the tradition of seeking bipartisan solutions to these very complex problems, and we pledge our resources to assist you and your colleagues in any way we can.

Thank you for your time.

The CHAIRMAN. Well, thank you very much, Mr. Guthmiller.

[The prepared statement of Mr. Guthmiller can be found in the appendix on page 111.]

Mr. Kimpel, it is a pleasure to welcome you here. In 1982, I brought Senator Howard Baker, who was then our Republican

Leader, to New Energy, in South Bend, for the dedication of that plant. And you have progressed in the last 18-years in remarkable ways, and it is good to see you here today.

STATEMENT OF NATHAN KIMPEL, PRESIDENT/CHIEF OPERATING OFFICER, NEW ENERGY CORPORATION, SOUTH BEND, INDIANA

Mr. KIMPEL. In 1982, Senator, it was still a hole in the ground. Our official start-up was in 1984, but we are still tremendously happy that you had such an integral part to play in the organization of our plant.

My summary statement is still on Indiana time, so I will start out by saying good morning, Mr. Chairman. There are very few times when I get the opportunity to do what I like doing best, and that is to come and talk to people about ethanol, about ethanol's role in reformulated gasoline, and also ethanol's role in the oxygen requirement in reformulated gasoline.

New Energy is located in South Bend, Indiana, and that means that I have the distinct pleasure to be able to call the Chairman of this committee my Senator, and I am really proud of that. We began operations, as I said, in 1984. We started out as a 52.5-million-gallon-a-year ethanol plant. Today, our plant is operating at a rate of approximately 85- to 88-million gallons. That is an increase of in excess of 60-percent.

Our company employs directly 138-people, but the economists in our area tell us that, in fact, the spillover effect or the multiplier effect is something like four times that, with all of the outside contractors, the truck drivers, the people that work on the railroad, and so forth and so on.

We consume approximately 31-million bushels. The majority of that corn is grown in northern Indiana. On an annual basis, we contribute in excess of $100 million to the northern Indiana economy. Obviously, the majority of that comes from the purchase of corn and other raw materials, good services, transportation, wages, and property taxes.

Since our start-up in 1984, we have produced almost 1.1-billion gallons of fuel-grade ethanol, and in the 16-years that we have been in operation, we have consumed 415-million bushels of corn. That amounts to in excess of $1 billion worth of corn purchases in that period, and that is brand new demand. Now, multiply that by the fact that New Energy is only approximately 6-percent of the total ethanol industry and I think that gives a good perspective of what ethanol does as far as the farm economy is concerned.

I could just about throw out the rest of my summary statement because, quite honestly, everything has been said before. I have an operations manager in our company and every morning he comes in to give me a synopsis of what has happened in the plant. And he usually starts out by saying, do you want the good news or the bad news first? And I always tell him, well, let's start out with the bad news and we will work up from there.

The obvious bad news in the Reformulated Gasoline Program is MTBE. The good news is the tremendous benefit that we have had over the last 10-years now of reducing carbon monoxide and 41,000-tons of toxic pollutants such as benzene. Benzene is down

24,000-tons annually. We believe that this is certainly partly due to the oxygen content of reformulated gasoline.

On the other hand, ethanol has been a tremendous success in the Chicago land area. The Chicago land also includes parts of northwest Indiana as far as Federal reformulated gasoline requirements, and there are virtually no water problems, certainly none that are directly concerned with RFG in the Chicago land area.

We do, however, have MTBE contamination in our area. As a matter of fact, within 2-miles of where I personally live, we have a leaking underground storage tank problem and one of the constituents of the pollution is MTBE. So this is certainly not an issue that is exclusive to places like California, New Jersey, and New York State.

What is being proposed to solve the problem? Well, we have certainly heard this morning a lot of discussion about the elimination of MTBE, but we also have heard that refiners claim they simply cannot eliminate the use of MTBE without the flexibility of producing non-oxygenated fuel, and have sought the elimination of the oxygen requirement in RFG. Quite honestly, we just simply don't think that that is a good tradeoff of clean water for clean air.

We have also heard an awful lot of conversation this morning about whether the Federal oxygen requirement is still valid. We have had a tremendously successful program. I simply can't buy the logic that we are going to have to throw out the oxygen requirement simply for the purpose of eliminating MTBE.

So what does the ethanol industry bring to the table as a solution? We don't want to be a hinderance to legislative efforts to address a serious public health and environmental issue. We want to be part of the solution. Toward that end, we have developed the following principles which we believe should guide congressional action on this issue.

First of all, develop a national solution. MTBE is a national problem, just like we have MTBE solution in Indiana even though we are in our area not an RFG area. Address the cause of the problem. That is MTBE in water, it is not oxygen in gasoline.

Protect the environment, don't trade air quality gains for water pollution. And we are certainly amenable to being as flexible as we possibly can to allow refiners the time that it takes to make a rational transition to increased ethanol usage.

One of the questions that has been raised and becomes part of the primary discussion is can we meet the demand if, in fact, ethanol is to be used to replace MTBE. Well, I can tell you that the ethanol producers say we can meet the demand. The American farmer says we can meet the demand. The Department of Agriculture says we can. The investment risk-takers say we can. They are already investing in new plant and equipment. The new technology players say we can. People like our friends at Arkenol and Masada and BCI are already prepared to do that. The only people that I hear saying that we can't meet it are the people that don't want us to meet it.

So, in conclusion, the domestic ethanol industry understands that Congress is faced with a daunting challenge of protecting water supplies by reducing the use of MTBE, but we want to do that without sacrificing air quality or increasing fuel prices. We see

ethanol as a solution. Increasing ethanol use in this program will allow MTBE to be phased out in a cost-effective manner, while protecting precious water resources and air quality.

Stimulating rural economies by increasing the demand for grain used in ethanol production will help farmers left behind in our booming economy. Encouraging new ethanol production from biomass feedstocks will provide additional environmental benefits and take a positive step toward the sustainable energy future that we have all been talking about this morning. The bottom line is we need to protect both air and water quality, and I think with ethanol we can.

Thank you, Senator.

The CHAIRMAN. Well, thank you very much, Mr. Kimpel.

[The prepared statement of Mr. Kimpel can be found in the appendix on page 117.]

Mr. Miller.

STATEMENT OF RUS MILLER, CHIEF OPERATING OFFICER, ARKENOL, INC., MISSION VIEJO, CALIFORNIA

Mr. MILLER. Good afternoon, Mr. Chairman. I would like to convey my apologies to Senator Harkin for not smelling the contaminated water he provided, but my brother lives in Santa Monica so I have already had the unfortunate experience of drinking that water.

The removal of MTBE from the fuel supply of the United States offers policymakers two choices. The first choice is to remove the oxygenated fuels requirement. Arkenol believes that the evidence in the EPA Clean Cities Program and Reformulated Gasoline Program of reducing air pollution after requiring oxygenated fuels over the objections of petroleum producers speaks for itself.

Since oxygenated fuels provide cleaner air, the second choice becomes then which oxygenate should be used. There are technical and societal factors to be evaluated in each case. Arkenol, being a technology provider for cellulose-to-ethanol production, concurs with the determination that ethanol is the best currently available route. While Arkenol technology may be applied to produce numerous other oxygen-bearing fuels, those fuels have not yet been proven in the marketplace, so ethanol remains the choice.

The question before the Committee today is what would be the demand for renewable fuels under various scenarios. The California Energy Commission published a report, "Evaluation of Biomass-to-Ethanol Fuel Potential in California," in December of last year. This report includes within it several studies of this question with ethanol as the fuel. The executive summary of that report is attached to my written remarks and a full copy of the report has been given to your staff.

I would like to address the key scenarios briefly and then answer your questions.

Scenario 1: The first scenario is oxygenated requirements are unchanged. To attain the required levels of oxygenation to effect air pollution reductions currently achieved, MTBE must be used in about 11-percent concentration in gasoline. As ethanol has a higher oxygen concentration, a blend would only require 6-percent ethanol to attain the same level of oxygenation. Ethanol has typically been

blended at higher levels of 10-percent to comply with the tax code. The complete replacement of MTBE with ethanol would generate a demand of over 1-billion-gallons per year solely within California.

Scenario 2: the oxygenate waiver is granted, except for EPA's seasonal requirements in carbon monoxide non-attainment air basins. Under this scenario, the Los Angeles and Sacramento air basins would be required to use an oxygenated fuel in the winter when carbon monoxide levels seriously exceed EPA clean air limits. The demand for ethanol to replace MTBE in such a scenario would be approximately 150-million-gallons a year.

A third scenario: oxygenates are no longer required. With no oxygenate requirements in California, there would likely be no renewable fuel used in the State. Petroleum producers are very unwilling to give up market share of their production volumes of basic gasoline. This is clearly expressed by the price of ethanol currently being $.66 a gallon, when unleaded gasoline is only $.85 a gallon in New York Harbor, and ethanol has a much higher octane rating which is unrecognized.

The ethanol transportation cost to California, for your information, is somewhere between $.08 and $.10 a gallon, and California gasoline is somewhat more expensive than New York Harbor gasoline due to a large number of refinery issues.

The fourth scenario is the renewable fuels standard is enacted. A renewable fuels standard is a sensible approach, but its implementation must be carefully considered to truly effect an expansion in renewable fuels use. This approach combines an awareness of the environmental benefits of renewable fuels on immediate air pollution through oxygenation of fuel, with an awareness of the environmental benefits of reduced carbon dioxide emissions, with an awareness of the societal benefits of reduced oil importation from abroad.

California uses about 14-billion-gallons of gasoline per year. The United States as a whole uses about 10-times that. The United States imports 50-percent of the oil needed to make that gasoline, at great cost to foreign exchange and being militarily prepared to defend those foreign sources, as you so accurately described in your earlier remarks.

The requirement for a renewable fuels portfolio would ensure a clear requirement of biologically-derived fuel with arithmetical precision. A 1-percent standard would continue a nationwide demand of 1.4-billion gallons, which is roughly the current production capacity of ethanol in the U.S. An additional 1-percent when added to that standard would then double the volume needed and displace 2-percent of the imported oil that we currently use.

California has identified waste biomass volumes which could replace 30-percent of the total gasoline used within the State. Other States have similar resource volumes. For example, in the L.A. Basin alone, 40,000 tons per day are put into a landfill. Seventy percent of that by weight could convert to ethanol, and that would be 1-billion gallons a year just from the L.A. Basin landfill volume.

You have heard from many people today who are more qualified than I to talk about various aspects of this decisionmaking process in which you are engaged, and you will hear from a few more. I

want to leave you today with the understanding that there is a current technology which can support the use of renewable fuels.

And more importantly from my company's perspective, there is an industry of biomass-to-ethanol technologies ready to meet nearly any demand for renewable fuels which can be imagined. These technologies can use the biomass from agricultural wastes, conservation resource lands, urban green waste, and municipal solid waste. These new technology companies need a reliable market for our products in order to attract leading institutions to finance the building of these plants.

We urge you not to succumb to this Nation's petroleum addiction or the same scare tactics used to resist the removal of lead from gasoline and the implementation of reduced sulfur in gasoline taken by the petroleum industry. Do not take a step backwards by ignoring the demonstrated air benefits of renewable oxygenated fuels. Use the opportunity created by the current MTBE and oil prices crises to set an example for the world and put our Nation on a path toward a sustainable future, free from the influence of Ambassador Woolsey's Middle East autocrats.

We look forward to your decision supporting the renewable fuels community, and I thank you for the opportunity to appear before you today.

The CHAIRMAN. Well, thank you very much, Mr. Miller.

[The prepared statement of Mr. Miller can be found in the appendix on page 127.]

Mr. Grumet.

STATEMENT OF JASON S. GRUMET, EXECUTIVE DIRECTOR, NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT, BOSTON, MASSACHUSETTS

Mr. GRUMET. Thank you, Mr. Chairman. My name is Jason Grumet and I am the Executive Director of the Northeast States for Coordinated Air Use Management. For over 30-years, NESCAUM has been providing technical and policy advice to the air pollution programs in the 8 Northeast States, and it is in that capacity we have authored several studies on issues of RFG and MTBE, also in that capacity that I was both honored and challenged to serve on the Blue Ribbon Panel earlier this year.

It is sincerely a pleasure to be here with you today, Mr. Chairman. I want to thank you for your perseverance, and recognizing that these seats are somewhat more padded than those behind us, I would like to also acknowledge the commitment of our audience.

Mr. Chairman, there is much that is going to be in debate and controversy before this committee, but there is one that I think is perfectly clear, and that is if we are going to solve this problem, we are all going to have to reach out and forge creative, and I think sometimes courageous, even unusual coalitions.

It is in that spirit that the Northeast States earlier this year were joined by national environmental groups, the American Petroleum Institute, and a host of refiners and gasoline marketers to propose a set of principles that we believe this committee should consider as it moves forward. While I will be reflecting upon that collective wisdom, I want to stress that I am here solely today as a representative of the 8 Northeast States.

Representatives of our region are notorious for speaking quickly, Mr. Chairman, and I want to assure you that I will not try to read the entire testimony that I have submitted. But what I would like to really to is first of all just try to provide in the first half of my testimony some context for this debate and then in the second half of my testimony talk about the framework for legislative action that we propose, and then with your leave, Mr. Chairman, in the third half of my testimony, and I am sure in questions that follow, speak particularly to the issues that relate to renewable fuels.

At the outset, Mr. Chairman, I think we have all acknowledged that the RFG program has been a profound success in reducing air pollution and in protecting public health. The challenge that is before us is clearly to maintain those substantial environmental and public health benefits, while at the same time effectively mitigating the environmental and economic harms caused by MTBE.

Adding to this challenge is the very real need to provide confidence in a secure and growing market for ethanol, and the opportunity to provide much needed support for a broad array of domestic and environmentally beneficial fuels.

Unfortunately, Mr. Chairman, we do not share Senator Grassley's optimism that existing administrative authority at either the Federal or State level provides us with the ability to address this problem. And we are here before you today to urge, in fact, with an unprecedented coalition, that the Clean Air Act be changed.

We believe that we, with the five principles I will discuss, can effectively protect air quality and water quality. We can ensure substantial growth in ethanol, and we can provide refiners with the flexibility that we believe they need to ensure a low-cost, adequate fuel supply.

I would like to submit attached to my testimony the announcement of these principles that the Northeast States brought forth earlier this year, and supportive statements from the American Lung Association, the Natural Resources Defense Council, and the American Petroleum Institute, that forged the beginning of this coalition.

Let me now review the legislative framework that we urge you to consider. First, we believe it is essential to repeal or waive the oxygen standard in reformulated gasoline. Mr. Chairman, we think that it is simply not possible to protect air quality and water quality while ensuring an adequate, low-cost supply of fuel while that oxygen mandate is still in effect.

While the Northeast States embrace the growth in renewable fuels and have tremendous optimism about a future biomass industry, we are convinced that there are policy approaches available to this committee which will do much better to further those legitimate ends than requiring the sale of ethanol in the Northeast States in the summertime.

Frankly, Mr. Chairman, as we seek to forge new coalitions, we are disappointed by legislative efforts that seek to maintain the oxygen mandate because we are convinced that those efforts simply do not hold promise to build the national coalition that will be necessary to resolve these issues, and we urge the Committee to look beyond them.

Second, of course, it is necessary to severely curtail or eliminate MTBE throughout the entire fuel supply. We propose a three-step process to accomplish this. We propose that the U.S. EPA be compelled to regulate and, if necessary, eliminate MTBE to protect public health, welfare, or the environment. At a minimum, we urge that EPA be compelled to reduce MTBE to the levels used prior to the 1990 Clean Air Act. And, finally, I think we agree with Senator Grassley that the States must be clearly authorized to further regulate MTBE if necessary to protect public health, welfare, or the environment.

Next, we believe it is incredibly important that we enhance the environmental performance standards in the Reformulated Gasoline Program to reflect the stricter of what was actually achieved already in the first phase of the program or what is required under statute for VOCs, NO_X and toxic emissions. And I am pleased to be able to represent to you that the American Petroleum Institute joins us in that regard.

We believe we need to promote consistency through timely Federal action, and finally that the transition that must be undertaken in our Nation's fuel supply must be enabled with enough lead time to ensure an adequate and low-cost supply of gasoline.

Let me now turn, Mr. Chairman, to the impact on renewable fuels, which I know is of great interest to this committee. If we are going to create a secure future for ethanol that I think we all desire, I truly believe we must shift our collective emphasis away from a further focus on market protection and toward rejuvenated focus on product quality.

Mandates unquestionably provide a security never possible in a free and open economy. At the same time, that security comes at considerable cost to the ethanol industry because, Mr. Chairman, it undermines public confidence in the quality of the product. It, in essence, suggests that we need to embrace the intuitive contradiction that ethanol is so good a product that it can't compete.

Now, we, or course, believe that that is not true, and we would like to reflect in our testimony an analysis that we have put together using work done by the DOE and the California Energy Commission which demonstrates, we think quite compellingly, that if we eliminate the competition and maintain the air quality requirements, the market for ethanol in this Nation is going to boom.

We support principles that we believe are going to lead at, at a minimum, a doubling of ethanol over the next decade. And while we are supportive of this tremendous growth, we are mindful that ethanol, like any product, has benefits and liabilities.

Used at the wrong time, Mr. Chairman, ethanol can, in fact, increase air pollution. It can substantially increase VOC emissions, it can increase NO_X emissions. And while reducing some toxic emissions, it can increase others. Used in the wrong place, Mr. Chairman, we believe that ethanol can, in fact, result in unacceptable transportation and distribution costs. And we are very concerned about forcing a disproportionate proportion of the ethanol market into the fringes of the country. However, these concerns are substantially mitigated, we believe, through a properly designed renewable fuels standard that enables the market to optimize when and where ethanol is sold.

I would like to thank Senator Daschle for his efforts to reach out to the Northeast States in letters last summer seeking our input on the renewable fuels standard and initiate that dialogue. I would like to submit the responses of myself and Governors King and Shaheen to the record. While those responses reflect some apprehension about future sales requirements, we indicate that we believe the renewable fuels standard may respond much better to our concerns about ethanol than congressional inaction that would result in a de facto summertime ethanol mandate.

In fact, Governor Shaheen notes that the renewable fuels standard shows great promise and, in fact, could set a wise national precedent. I should note that Governor Shaheen was referring to a renewable fuels standard which at the time imagined a doubling and not a tripling of the ethanol market. But nevertheless we believe that this is, in fact, the basis for the compromise that must be supported.

Finally, we very much support Senator Daschle's recognition of the differential benefit, and your support, Mr. Chairman, of the tremendous opportunities that biomass ethanol provide. In fact, we think that a greater than 1.2-to-1 ratio is important. Moreover, we are intrigued by recent efforts from Senators Smith and Inhofe to broaden the renewable fuels standard concept to embrace a wider variety of domestic energy sources that are envisioned under EPACT.

In closing, let me just say that there is certainly much work left to do. However, I truly am optimistic that by emphasizing market principles in an effort to promote renewable and clean domestic fuels, we can, in fact, fashion the necessary legislative solution in the coming months.

Thank you.

The CHAIRMAN. Thank you very much, Mr. Grumet.

[The prepared statement of Mr. Grumet can be found in the appendix on page 130.]

Dr. Morris.

STATEMENT OF DAVID MORRIS, VICE PRESIDENT, INSTITUTE FOR LOCAL SELF-RELIANCE, MINNEAPOLIS, MINNESOTA

Mr. MORRIS. Thank you very much, Mr. Chairman. I appreciate your patience. My name is David Morris. I am Vice President of the Institute for Local Self-Reliance, which is a 26-year-old nonprofit policy research organization that is based in Washington, DC., and Minneapolis. Our mission is to strengthen local economies.

Fifteen-years ago, I coined the term "the carbohydrate economy" to describe an industrial economy whose materials foundation consist largely of plant matter and whose processing and manufacturing enterprises were significantly owned by the cultivators of that plant matter. In other words, the carbohydrate economy maximizes environmental benefits, while also maximizing economic benefits to the communities that cultivate and process the raw materials.

We have a number of different reports, a flagship report on the carbohydrate economy, newsletters and the like, which I can leave for you. You have my testimony, and I thought that rather than summarize my testimony, since I would be redundant of a lot of the

other people here, I just thought I would say a couple of things in terms of history.

Six-years ago, I think, to this month, EPA had hearings in Rosslyn on the renewable oxygenate standard, and I came and testified on the renewable oxygenate standard. And those hearings were to allow ethanol to have a significant share of the RFG market, and so certainly the ethanol community was there. But there were some voices even then that were very disturbed about MTBE.

We may forget, but it was 1993 when Fairbanks, Alaska, banned MTBE and Missoula, Montana, banned MTBE. There, it was because of headaches. It was considered an air quality problem in those areas. So in 1994 when the renewable oxygenate standard debate occurred, there was very much a sense that something really was awry, although nobody was quite sure what it was about.

We may remember the attacks on ethanol by the methanol industry at that point attacking ethanol as, quote, "poisonous." I think it was Senator Harkin there that declared that he would drink a pint of his product if they would drink a pint of their product. And it was interesting that 4-years later, Santa Monica should stun the world by having to close down its water supply because of MTBE.

So here we are again, I think that if we take an even broader and more historical perspective, we have actually been here three times before, over 75-years. When the car companies built more powerful compression cars in the early 1920s, 1920, 1921, they had a choice of ethanol, which was selling 50-million-gallons nationally at the end of World War I, or lead. Ethanol was clearly the superior product, but it had one significant disadvantage. It took 10-percent of the gas tank, and the oil companies were not about to give 10-percent of their gas tank to the farmers, so they chose lead.

And we may not remember, but lead had a serious controversy attached to it. In fact, because of the explosion of a refinery of Standard Oil in New Jersey, the country banned leaded gasoline almost as soon as it went on the market. For 1-year, there was an intensive analysis of the environmental and public health effects of leaded gasoline, and to his everlasting shame the Surgeon General gave it a clean bill of health. Within a few years, 70-percent of all the gasoline sold in the United States was leaded gasoline.

Well, in the 1970s we woke up, perhaps for the wrong reasons, because of what it did to the catalytic converter. But nevertheless we also understood what it did to the brain cells of especially the young in inner cities. So we then phased out lead, and once again the oil industry had a choice. It could have used ethanol; it was perfectly viable as an octane enhancer and as a perfectly good product. Instead, it chose to reformulate the gasoline to increase the aromatic content.

They increased the aromatic content to about 40-percent, on average, of benzene, toluene and xylene. And then, of course, we found out that those things cause cancer, not brain damage, cancer. So then in 1990, with the Clean Air Act we said try it again, and this time put in an oxygenate. Once again, they had a choice of using ethanol or using their own product and, of course, they used their own product and here we are today.

Shame on us, shame on us, shame on us if we say try it again. Maybe they can do something with the alkylates, maybe they can figure out how to deal with the olefins that they have to take out. But I assure you we will be back 5- or 10-years from now with another new-found problem.

The problem with California in their analysis when they found out that something was going on with their groundwater—they immediately said, how come nobody told us? And the EPA—I don't quote, but I paraphrase—the EPA said, well, that was under the Air Quality Act, so our water department didn't look at it; it is our air quality department that looked at it. And California's response is to say let's get rid of the oxygenate, let's go back to 100-percent gasoline and take our risks with the oil companies.

It is a very one-dimensional analysis that occurred with the introduction of MTBE into the market, and I think that what we deserve now is a multi-functional, full-cost analysis, an analysis that looks at not only air quality, but water quality, and not only water quality, but toxicity, and not only toxicity, but the strength of the rural community, and not only the strength of the rural community, but foreign trade impactsexchange programs.

And we also have to realize—and I will close with this—that ethanol, and people have known this for 70- or 80-years, is just the beginning. When I talk about a carbohydrate economy, I am not talking about an ethanol economy. Ethanol is the base for a carbohydrate economy. It is the $.07 to $.12 a pound large commodity chemical that is the base, but already you have people that are talking about butanol and people who are talking about polylactic acid and people who are talking about $.30 and $.40 and $.50 and $.60 and $1.00 a pound chemicals and chemical products that can be made.

So what we are creating here is a biochemical industry, the first commodity of which is ethanol, and we should not lose sight of that. The argument between the cellulosic industry and the starch industry about who is going to produce ethanol is really somewhat of a nonsensical argument because starch is such a valuable commodity itself that it will clearly be made into higher-value plastic products, and then the corn stover will take over for the lower-quality ethanol products and other kinds of biochemicals.

The President of the United States has a recycled content standard of 30-percent for paper purchased by the Federal Government. By executive order, there is a 30-percent reduction in energy use per square foot in Federal buildings. Although we are not going to sign the Kyoto Protocol, I wish we were; I think the farmers should demand it. Aside from the Farm Bureau, I think that they would. That is a 30-percent reduction in greenhouse gas climate change.

So it seems to me that we should think once again about the 30-percent renewable oxygenate standard, except this time make it a 30-percent renewable fuels standard; 30-percent of all the gasoline in the country has to have at least a 10-percent ethanol blend. That would get us up to 3, 3.5-percent, and I think that is well within our means.

Thank you very much.

The CHAIRMAN. Well, thank you very much, Dr. Morris.

[The prepared statement of Mr. Morris can be found in the appendix on page 143.]

Let me just summarize for a moment. Many of you have commented, and correctly so, on the comments of my colleague, Senator Grassley, earlier on. Senator Grassley sort of drew the point that some of you have that air quality and water quality are both important, and I Senator Grassley, I think, shares the feeling of many Senators, maybe many members of the public, that in the solution of this particular problem legislatively we are unlikely to come to the equities that are suggested.

This may show too little faith in the legislative process, but we are going to continue with the legislative process, as I assured the Senator. That is the reason we are having the hearing. But it does bring to a focus your point, Dr. Morris, that Senator Grassley would apparently share, not a conspiracy theory, but with regard to fuels for automobiles over the course of time the oil industry at any number of junctures might have accepted an ethanol product as a part of the situation, but chose something else. There is a feeling that, given the opportunity, oil companies might continue to do so.

Now, Mr. Grumet has an important thought that perhaps coalitions can be built that include the oil people, as he had them in his coalition. We could come, I suppose, to a problem in which corn farmers said, we are really not interested in biomass, we are interested in corn. We all have these problems in terms of constituencies and places that we take a look at things, but nevertheless this is a serious problem.

And it is compounded starting with Mr. Woolsey's testimony and the views which I share that essentially our problem in terms of national security and the security of our whole economy revolves right now on our dependence upon petroleum-based fuels in this country. It is something we will not be able to get around immediately, but our failure really to do very much about it over the course of the years and to come once again to the kind of past we have had in the last few days of not national hysteria but something approaching that with my constituents sort of illustrates how vulnerable we are.

In my view, we will very vulnerable again and again until finally we have an extraordinary problem that causes either a national recession or a war, as we try to fight our way through and simply demand at gunpoint that the fuel be made available, when all of that was really unnecessary, aside from the particular interests as they contrived in legislation that we have.

Now, the problem as I see it—and I am intrigued by your thought and maybe I didn't get it correctly, Mr. Miller, but you claim that ethanol in California costs $.66 per gallon. Was that your testimony?

Mr. MILLER. That was the number talking to a distributor when I spoke to him on Thursday. That is the net-out cost.

The CHAIRMAN. That is the net-out cost. What do you mean by that?

Mr. MILLER. Well, with the $.54 removed, so his selling price today is $1.20. So the real cost to the final user is $.66.

The CHAIRMAN. Well, that strikes me as very low. We hear Mr. Woolsey saying this morning earlier on that typically the price has been about $1.00, and therefore the subsidy sort of got you down into something that was competitive with petroleum, with the ups and downs.

But you are saying for the moment, petroleum is $.85. Is that right?

Mr. MILLER. The Wall Street Journal on Wednesday, $.86, unleaded, New York Harbor.

The CHAIRMAN. Now, there is something there that strikes me as curious, although we are talking about curious situations. If the market for ethanol is $.66 and it is $.86 for petroleum-based, it is a wonder why people are buying the latter.

Mr. MILLER. Defense of market share by the oil companies.

The CHAIRMAN. What do you mean by that?

Mr. MILLER. They don't want to lose any market share. That is a half of a percent or a percent that they don't want to give up, and particularly for the majors who have an oil production volume that they also want to maintain. You get a little bit different behavior on the part of people like Tosco and Getty, who are independents.

The CHAIRMAN. Well, is this an antitrust problem in this case, in which you have deliberate frustration of competition?

Mr. MILLER. I am not a lawyer, Sir.

The CHAIRMAN. Mr. Grumet, you have taken a look at these market-based solutions. What do you have to say?

Mr. GRUMET. Mr. Chairman, if, in 5-years, with the elimination of MTBE and the reduction in sulfur which will further deplete the octane pool and the maintenance of air quality benefits—if, in 5-years, the ethanol market has not grown by leaps and bounds, then I highly recommend that antitrust investigation.

But I would suggest to you that as much as there are interests in notions of conspiracy theory as the unifying themes here, these are publicly-held competitive industries and when faced with the low cost of ethanol and the need to displace air toxics and increase octane, I think that the ethanol industry is going to do extremely well. And if we could work together to provide the market reflection to enable that, we would be in much better shape.

The CHAIRMAN. Well, Mr. Grumet, just practically how will this happen? Is there some statesmanship in the oil industry somewhere that says we ought to stop fighting all this? After all, we are an energy company. We are not an oil company, but we provide energy, btu's.

Mr. GRUMET. Mr. Chairman, it is a unique and probably never again opportunity for me to be here representing the oil industry. So I, with some chagrin, will go forward. I think that the proposal that Senator Daschle and the administration have identified is certainly worth pursuing in two important ways.

It is elegant in that it provides the market confidence that I understand the ethanol industry is demanding in this debate. Our interest in it is based on our confidence that that market is, in fact, going to grow itself. So a market requirement that is, in essence, redundant to what we believe the free market will actually provide is a small price, we believe, to pay to free us from the concerns we

have on the other edge of the ledger, and that would be to perpetuate a scenario of ethanol mandates in the Northeast.

By allowing the free market, in fact, to figure out the best way to optimize the sale of ethanol, what we believe will happen is that ethanol will grow where it makes sense. If our concerns about distribution costs are exaggerated, well, then good for ethanol. It is going to come into the Northeast. If those costs, in fact, however, are real, well, then good for the Northeast and good for you because we will not be, in fact, imposing ethanol where it doesn't make economic sense to do so. The free market can answer that discussion. None of us, Mr. Chairman, can.

The CHAIRMAN. When Dr. Woolsey and I wrote our article and we were doing our research, our scientific backers and what have you indicated they felt, given this change in the polymer chain that Woolsey was describing, the cost of that product is likely to come out more like $.50 a gallon at the end of the trail, and it wouldn't require any subsidy at all.

In other words, the one value of getting to that point is we end the argument before the Congress of going for a subsidy for 5-years or 7-years or however long we pass the situation, and we have something out there that is being produced by DuPont or by whomever. We had a panel of these people with the President of the United States down at the USDA this August when he proclaimed the national situation.

We were grateful for that, but he didn't proclaim the money for the research. So we are still working on that and that will be forthcoming and it is not a whole lot, but the fact is that we may arrive at solutions. If ethanol is already $.66 out in California, that is not $1.00, or $.75 or the various other stages. In fact, producers point out that given greater volume, greater efficiencies, and breakthroughs each year, the $.66 goes lower in the process so we finally have a situation in which clearly there is competition, unless there is deliberate blockage of the distribution system or other means of subverting markets in the country, which clearly is an antitrust problem, but one I suspect the Congress would solve long before we would go through the litigation of that.

What I suppose I am trying to gain from expert testimony is, is this realistic. Is it possible that in this world, given all the circumstances that we are describing, the cost of ethanol from some biomass form or some carbohydrate form or what have you is, in fact, going to be competitive, and, in fact, the competitor of advantage so that ultimately the fuel system of the country verges in a market system that way?

Do you have a thought on that, Dr. Morris?

Mr. MORRIS. Yes, I do, Mr. Chairman, and thank you. I think the answer is no. As someone who has studied this issue for quite some time, I will be a skunk at a picnic and say that. I think that the problem is that the price of oil is enormously subsidized, as people here have pointed out, and that what one needs to do is to price the price of oil itself correctly.

Certainly, if you lower the income tax, which all Americans would like, and require the Pentagon to pay the $40 or $50 billion that it uses to protect oil at the pump, then you would begin to sort of internalize the real costs. But the idea of ethanol getting down

to $.50 a gallon presumes, by the way, that the feedstock would be zero cost, and I think that for those of us who are interested in raising the income of farmers, the idea that we are saying we are going to make it by not paying the farmers anything—it is going to be a waste product and we will help you because you are not going to dispose of it—is frankly not very good public policy.

So although the price will come down, I think it will come down because of process improvements, maybe another dime or so, but largely because you will begin to get higher-value chemicals that will be coming off of it. So ethanol will become sort of a by-product, and as such ethanol can, in fact, then be sold for a lower amount of money. And it may even be able to get down to maybe $.60, $.65, but you are then not talking about 5 or 10 billion gallons of ethanol. You are talking about probably 1 to 2 billion gallons of ethanol.

So I think that we should be very careful about trying to run after the price of gasoline, as artificially low as it is, by sort of forcing farmers to kind of bear the burden and having the taxpayers come in with $.54 to kind of bail out the farmers. I think that if we are talking about a long-term approach here, we really need to deal with the price of oil, which in some ways—and I know this is not by any means the forum, and maybe not the Chairman either—brings us back to the Kyoto Protocol.

And there is, in fact, internationally a call by nations to impose some tax, some regulation, some restriction on the emissions of carbon and the burning of carbonaceous fuels that don't absorb carbon. And that, it seems to me, is the hook that we should at least explore very seriously rather than reject out of hand because then we can talk about ethanol competing not at $.50, but competing at $.80 or $.85, which I think is more reasonable.

The CHAIRMAN. But your point is, I gather, that given the subsidies that go to oil now, if you strip all of those out, you come out to a different figure for oil, obviously. Now, I suppose likewise I am saying if you strip out the various subsidies involved in ethanol, you come to a different figure. After all of this is stripped out, we are just trying to come to some idea of where the market would be, where the viable competition is at that point.

Yes, Sir?

Mr. MILLER. If I could offer an instructive example, in the late 1970s, early 1980s, when the Department of Energy and Agriculture took a very big interest in ethanol technology improvement, the cost for a dry mill ethanol plant was something on the order of $5 of capital per installed gallon of annual capacity.

Over the course of the next 10-years, the technology has improved to where now the cost is something, I don't know, perhaps $.125, something like that, divided by 4. Today, Arkenol and others are nipping at our heels. We can put in an ethanol plant from cellulose for about that $5. I am not sure that we can get down to quite that factor of 4 in the next 10-years, but we can certainly improve that enormously.

Even with that, our cost of making the ethanol is still—two-thirds of that is just the capital, the debt service. So we can get very close to the numbers that you are talking about. However, having said that, to answer your question about what technology

can do, I still think that Dr. Morris is right on target with kind of the grander policy issue that needs to be addressed.

Mr. GRUMET. Mr. Chairman, if I could just add a thought or two on the issues of subsidies and sales requirements, I think generally we believe that subsidies and sales quotas have a place in our economy, and those are to cure market failures and to overcome market barriers. Toward that end, the notion of an ethanol subsidy is not a policy that we in the Northeast are here today to challenge.

What I do hope is that as the ethanol industry matures, we fill find it rational to focus those subsidies where they are needed most, and that would be on the smaller farmers, ont he biomass producers, on the folks who are trying to get a foothold in this market. And, of course, we would wholeheartedly endorse a review of the subsidy approach to mega corporations, regardless of whether they are making oil or ethanol or Kathy Lee Gifford's clothing in the Third World. I mean, I think that is a noble yet complex legislative enterprise.

The CHAIRMAN. Well, it certainly is complex, and maybe noble, also. I suppose I am just curious as to whether any of you know of people who have done studies—maybe you have done them yourselves—about the cost factors and the subsidy factors. This committee—you have already heard by colloquy on the sugar thing—is acquainted with all sorts of subsidies that sometimes have disastrous results and sometimes have good ones, I suppose.

And we are talking now in a broad term in terms of subsidy of agricultural America. You have touched on this a little bit, Mr. Grumet. The Secretary keeps talking about the very small farmers, and I suppose the large farmers, and you get into almost a class or a numbers distinction as to who it is you are trying to help.

I am just trying to separate for a moment what is physically possible in the chemistry and formulation of fuel, and Dr. Morris probably makes an important point that Mr. Woolsey did earlier. After you separate out all of the biomass or corn-based ethanol, or however we get to it, the case has never been made that this substitutes for all the petroleum-based fuel in this country, but a percentage. Ten, 15, 30 has been mentioned, but that is not 100, it is not even 50. So you still have out there a very large problem, although discoveries may occur in the next few years that supplant many of our thoughts about fuel and energy.

The question is how do you keep the markets available, and the incentives and the capital that could be found to do these things when they come along without having all of the encrustation of everything else we have done legislatively that sort of squeezes them out.

Mr. MORRIS. I would say, Mr. Chairman, that I need to leave. I am sorry.

The CHAIRMAN. Yes.

Mr. MORRIS. You shouldn't come to Washington, DC., to walk out on the Chairman of the Committee.

The CHAIRMAN. No, but it is already 1:15 in the afternoon.

Mr. MORRIS. I have to be someplace at 1:30, but I thank you very much.

The CHAIRMAN. Thank you for coming. In fact, I thank all of you for coming. You have been extraordinarily patient and helpful.

The hearing is adjourned.
[Whereupon, at 1:15 p.m., the Committee was adjourned.]

A P P E N D I X

APRIL 11, 2000

Statement of R. James Woolsey

United States Senate
Committee on Agriculture, Nutrition and Forestry

Hearings on Reductions in MTBE and the Demand for Renewable Fuels

April 11, 2000

Mr. Chairman and members of the Committee, it is an honor to be asked to testify before you today on this important subject.

The near trebling of oil prices in the last year has led to the price of gasoline and diesel fuel moving steeply upward to the neighborhood of $2 a gallon, to consumer and truck driver protests, and to increasingly hard times in rural America as the fuel costs of farming climb sharply at a time when commodity prices are badly depressed. In the meantime California and other states, and now EPA as well, have moved against MTBE being used as an oxygenate in reformulated gasoline due to its toxic effect on our water supplies, necessitating a search for a way we can preserve past gains in cleaner air while not sacrificing clean water.

Meanwhile Saddam Hussein sits and smiles as the price of his oil – as well as that of his neighbors' (which, he doubtless believes, he may again be able to seize) -- skyrockets, giving him more to spend on his military forces, including longer range ballistic missiles and weapons of mass destruction. He can be confident that within the next decade or two – the period during which most independent assessments of reserves suggest that world petroleum production will begin to decline – the world's sharply increasing demand for petroleum will increasingly have to be satisfied by him and his neighbors, to their great profit.

On another front, larger numbers of scientists are becoming concerned that humanity must do something to reduce the pollution caused by petroleum products and the emission of man-made greenhouse gases that contribute to global warming. There is great and understandable resistance in many countries to spending vast sums to re-tool the world's industrial infrastructure to deal with this distant but important problem, but it is worth noting that several major companies such as Daimler-Chrysler and Ford have substantially softened their critique of the global warming phenomenon.

In the developing world many nations ever more heavily into debt as the sharply climbing prices they must pay for imported oil substantially exceed what they can earn from their exports of low-priced agricultural commodities. Subsistence farmers and their families in many of these countries remain mired in terrible poverty.

Although all these serious problems may at first seem unconnected, Mr. Chairman, they in fact all have essentially the same cause – over-dependence by the rest of the world on petroleum-derived products that will increasingly have to come from the very troubled and unstable Middle East.

There are many dimensions to this problem. Some of the very promising solutions, for example, involve reprocessing all sorts of organic wastes (not only biomass but also, for example, used tires) into various forms of energy. In today's hearing we are focused on the problem created by the toxic nature of MTBE as a gasoline additive. But I want to stress that there is always a temptation in government to deal only with the problem immediately at hand – in today's Washington that would have to be consumer and trucker ire at high fuel prices and avoiding backsliding on clean air standards as we move away from MTBE. There are palliatives available – jawboning OPEC, drawing down the Strategic Petroleum Reserve, repealing the 4 cents/gallon gasoline tax, exploring for oil in wildlife areas, or increasing the production of starch-derived ethanol. But we have to take the long view with respect to solutions, and such short-term steps are not going to have a decisive effect even on the immediate and politically salient matters, much less the long-term problems set out above: dependence on the Middle East, greenhouse gas emissions and other environmental degradation, and rural poverty.

We must find solutions that can have a decisive impact on the underlying cause of the these problems and that, at the same time, require as little disruption as possible in people's lives and as little a drain as possible on our national resources. We need, in short, to maximize our independence from oil, increasingly Mid-East oil, while minimizing the need to make huge changes in our national infrastructure.

Why do I say that focusing on increasing the use of starch-derived ethanol does not meet this test of dealing with underlying causes? It is important to realize that developing a starch-derived ethanol industry has been a positive thing for the country. The subsidy which the government provides has made possible the birth of this industry, but as long as the ethanol industry is centered on using only the tiny share of the world's plant life that comprises starch and natural sugar, it will never grow to reach even toddler stage – it might grow from one per cent of the gasoline market to two per cent, but not much more. It will never even reach adolescence, much less adulthood. And, in such a case of perpetual infancy, the subsidies will also probably need to continue for many years, unless gasoline prices get very high indeed.

The small industry that the ethanol subsidy has brought into existence provides replacement, nationally, for around one per cent of the U.S. gasoline supply. It is mostly concentrated in the Mid-West. Ethanol reaches the consumer there in the form of E-10, or gasohol (10 per cent ethanol, 90 per cent gasoline). There has been substantial resistance in other parts of the country, however, to extensive use of this starch-derived ethanol for three reasons.

First, those who care about clean air (I take it, all of us) know that. although ethanol burns very cleanly and ten percent replacement of gasoline by ethanol in a fuel tank means less pollution out the tail pipe, that is not the only way pollutants get into the atmosphere. Because of the way most major producers blend gasoline, if the percentage of ethanol in a car's tank is below about 22%, there is a slightly higher vapor pressure in the tank than with gasoline alone, and thus there is a risk that, in the summertime in some climates, some of the pollutants that are in the gasoline are more likely to be carried out into the atmosphere by vaporization and will thus add to ozone pollution.

By blending gasoline differently (removing butane and pentane) as is done already by two oil companies, Getty and Tosco, this evaporation problem can be prevented and mixtures of gasoline and ethanol, from whatever source, can be made compatible with our having no backsliding on air quality. Another possibility, envisioned in Senator Daschle's bill, would be to permit areas where there are high ozone levels in the summer (and where oil companies choose not to remove butane and pentane) to forgo gasoline additives during those months by obtaining credits from areas with low ozone levels where ethanol can be used year-round, such as the Mid-West. And of course flexible fuel vehicles (of which there are hundreds of thousands on the road already) can burn fuel mixtures with over 22% ethanol and for these mixtures there is no vapor pressure problem.

A second source of opposition faced by starch-derived ethanol is less remediable. In this country corn provides almost all of the starch for ethanol and thus there is a certain amount of understandable corn-envy outside the Mid-West. -- a natural resistance to paying a federal subsidy for a product when the financial benefits of its use flow almost entirely to the states that produce large amounts of corn and to the small number of companies that process most of the corn into ethanol. The prospect of corn-derived ethanol's needing a subsidy into the indefinite future gives this objection added power.

Third, corn- or any other starch-derived ethanol requires petroleum products for cultivation and fertilization of the basic crop, and this has led some to emphasize that the amount of energy required to produce corn-derived ethanol makes it a poor bet as a substitute for gasoline. The New York Times has estimated that it takes about seven gallons of oil to produce eight gallons of corn-derived ethanol. It may reasonably be argued that use of no-till agricultural methods, and taking account of the fact that other corn-based products in addition to ethanol are typically produced in today's ethanol plants, would change these numbers by a gallon or so for the better. But such a recalculation would not be likely to counter the critics' central concern.

For ethanol made from cellulosic biomass, however -- essentially anything that grows or has grown, including much of urban waste - the latter two above objections don't exist.

Cellulosic biomass is essentially everywhere, not just in the Mid-West. If we can use it, something like 80-90 per cent of plant life and plant products, to make transportation fuel and

other forms of energy we will not be restricted to using the tiny share of plant life represented by starch or naturally-occurring sugar. The promise of biomass as a source of energy has an analogy in the possibilities that were created when we began to be able to make integrated circuits out of sand instead of being restricted to making them out of metal and plastic.

Professor Lee Lynd of the Thayer Engineering School at Dartmouth has estimated that by using only a portion of the country's agricultural residues we could increase by about a factor of eight the amount of ethanol we produce today. Some agricultural residues, such as rice straw, must be removed from fields and disposed of in any case, and thus often have a negative cost (or "tipping fee"). For other agricultural wastes there is normally a low cost to collect and transport them to an ethanol plant. For these other wastes and for dedicated crops, such as switch grass, Professor Lynd estimates collection and transportation costs of around $40 a ton on average. Since a ton of cellulosic biomass contains nearly half the energy of a ton of petroleum, this means that the raw material for biomass ethanol -- even using dedicated crops or the more difficult-to-collect forms of residues – would be available at about the equivalent cost of oil when oil costs $10-13 per barrel. Thus, even considering the need for processing improvements for biomass-derived ethanol, one can look forward, after a transition period in which a subsidy would be needed, to an infinite and renewable supply of raw material for transportation fuels at costs quite competitive with oil if oil stays at or above today's prices.

The amount of energy required to produce biomass-derived ethanol is quite small, as is the amount of CO2 emitted in the life-cycle of growth, production and use. On such a life-cycle basis, the 1997 Five Laboratories Study by DOE indicated that a vehicle powered by biomass ethanol emits well under one per cent of the CO2 emitted by one powered by gasoline and about one per cent of the CO2 emitted by a battery-powered vehicle (when the electricity therefor is made by burning fossil fuels) or a vehicle powered by corn-derived ethanol (because of the petroleum used in fertilizing, cultivating, etc.).

So those who have built the corn-derived ethanol industry have made a good start in moving us toward a world in which carbohydrates can begin to replace hydrocarbons. But their efforts have been, to carry the computer analogy further, the equivalent of the commercialization of the main-frame: hugely important, but only the first step. Now the transportation fuel equivalent of the first silicon chip is about to start coming off the production lines, and those in today's ethanol business have to decide their course of action. Do they want to continue to try to be, over the long run, a dominant share of a tiny subsidized market? Or do they want to help lead the nation and the world into a major technological and commercial development – one with immense promise in a whole range of ways -- and become instead important participants in what can, in time, become a huge free market?

As this Committee considers Senator Daschle's bill, I hope it will keep these factors in mind, and give adequate encouragement to the transition to a future in which biomass is used on an increasing scale to produce transportation fuels and other energy. Such a development can

only come about if it becomes apparent to all the potential participants in the ethanol market that the future is with biomass. In my judgment, this should suggest to the Congress that ethanol made from biomass should be encouraged at least twice as much by the relevant formulae in the bill as ethanol derived from starch. I would have preferred a performance-based standard that focused on petroleum replacement and renewability, but this bill is a good vehicle for an important purpose, and if there is sufficient long-term encouragement of biomass use for ethanol production, it seems to me that the most important national objective will be met.

Strong government encouragement of the use of biomass for ethanol production will, I believe, help the country move decisively in this new and promising direction. There have now been exciting developments of genetically engineered biocatalysts that can break biomass down into various sugars and ferment the latter to produce ethanol. I would point out that those who make ethanol today from corn are free to begin to use these technologies to move into producing biomass-derived ethanol as well as other products from biomass, such as cattle feed. The same is true of corn farmers as suppliers of the raw material for ethanol – they would be able to have new cash crops in addition to corn, namely switch grass, stover, and fiber of various sorts.

Mr. Chairman, major positive political changes such as a move toward biomass-derived ethanol, first as a replacement for MTBE and then increasingly as a replacement for gasoline, can occur only when people have the will to form new political coalitions to bring such steps about. I have spoken all over the country on this issue in the three and a half years since you first asked me to address renewable fuels and energy security before this committee: to farm groups, ethanol industry groups, environmental coalitions, organizations focused on American and Israeli security issues, and academic conferences. And of course last year I was honored to be your co-author for an article on the subject in Foreign Affairs: "The New Petroleum."

I believe that the time is right for a major coalition to come together behind the sharply increased use of biomass for ethanol production. It doesn't matter that many of the people who have reason to support such a shift haven't worked together in the past: that's what makes politics so fascinating in this ever-changing country. With my tongue only slightly in my cheek I would say that what we potentially have is a coalition between the cheap hawks (i.e. those interested in national security, but who want to fight no more wars in the Mid-East than absolutely necessary), the do-gooders (i.e. those interested in improving rural prosperity in developing countries), the farmers, and the tree-huggers. In one way or another, Mr. Chairman, that should sweep up nearly all of us.

(Mr. Woolsey practices law in Washington D.C. with the firm of Shea & Gardner. He has served in various positions in the federal government, most recently as Director of Central Intelligence 1993-95. He currently serves as Chairman of the Advisory Committee of the Clean Fuels Foundation and also serves on several corporate boards, including BC I Corporation; BCI and another company whom he represents, Changing World Technologies, Inc., are involved in the conversion of biomass and other organic materials into useful products, including ethanol.)

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April 18, 2000

The Honorable Richard Lugar
United States Senate
Washington, D.C. 20510

Dear Senator Lugar:

Thank you for the opportunity to appear before your Committee and for the courtesy extended to me to testify first in order to permit me to meet a court date in California. I always appreciate the opportunity to support your efforts to promote the biomass industry.

I am sorry, however, that I did not hear testimony and comments of my fellow panel members and the panel that followed. I have received a report on what transpired and, based on that, would like to add the following to my testimony.

You asked the question as to my opinion on what is needed to accelerate the advance of the cellulosic biomass program. I responded by highlighting the importance of bioengineering enzymes to more rapidly and less expensively hydrolyze the cellulose fraction of biomass. From testimony and discussions at your hearing, I believe there is another critical pillar that must rapidly be put into place – certainty in the industry.

Those companies prepared to now go forward with the next generation of biorefineries cannot do so without needed capital. The capital is most difficult to raise when the ethanol industry is fraught with uncertainty over the struggle over MTBE and the oxygenate standard.

Senator Daschle has long worked to find a legislative solution to those issues. Gaining needed support from his colleagues has proven difficult and your hearing advanced the prospects of that legislation. I fully support Senator Daschle's overall approach that includes options for states to phase out the use of MTBE and to justify any waiver from the Clean Air Act oxygenate requirement. The legislation also establishes a renewable fuels standard (RFS) and provides for credit trading to ensure needed competition – competition between ethanol and RFS credits, whatever is best for a state or region of the country in terms of economics and pollution reduction.

I understand that there was considerable discussion at the hearing on the competitive price of ethanol in the marketplace. My friend David Morris made an excellent point – history has shown that it is not the competitive price of ethanol that gains the attention and support of the major oil companies, it is the determination to keep the transportation sector in the near total grip of hydrocarbons. Any loss to carbohydrates is simply not welcome, even if there is a price advantage. I understand that both you and Senator Harkin recognized this point.

It can, of course, be said that in due course and under the correct circumstances, the majors will launch their own biorefinery industry – after the technology and the science have been advanced with government funds and by entrepreneurial pioneers. That approach runs afoul of the democratization of the energy industries – the need to ensure that farmers, foresters, wood lot owners, etc., can keep much of the value-added benefits of biorefineries in their own communities.

I would hope that it will be possible to advance Senator Daschle's legislation while the pressure of high fuel prices is with us. There are plenty of opportunities for both parties to take credit for legislation that meets the urgent needs of the nation.

I spoke of coalitions that are forming up to advance the biomass industry, and ultimately the carbohydrate economy. I understand that other witnesses covered coalition building. One major group that needs to be included is the automobile industry. I mentioned the issue of increased vapor pressure when ethanol is blended with gasoline at low levels. Oil companies can address this issue with low-Rvp blendstock. But without standards for sulfur, aromatics, olefins and a driveability index, that blendstock may not meet the needs of engine performance and pollution reduction required by the auto industry and by air quality standards. Other areas where the ethanol industry needs to work more closely with the auto industry includes CAFE credits, on-board canister performance, hybrid electric vehicles using ethanol, and fuel cell technology used in automobiles. I believe a hearing on these matters would be most helpful.

Thank you for appending these comments to my testimony.

Sincerely,

R. James Woolsey

Statement of Senator Bob Kerrey
Hearing on MTBE and Renewable Fuels
Senate Agriculture Committee
April 11, 2000

We are ostensibly here to discuss the problems associated with the use of MTBE, and how this can be solved by using ethanol and renewable fuels. But it is more than a little ironic that our discussion occurs against a background of rising oil prices. We have all received hundreds of telephone calls and letters from constituents who are seriously impacted by these price increases, such as independent truckers.

We have had this debate many times before. The market for ethanol was born against the background of the oil embargo of 1973. And I fear that we will be back to discuss this topic again, for our nation has failed to seriously deal with the inexorable upward march of oil imports, and the resulting impact upon our national security. We have not taken it seriously, despite an enormous national commitment to protect the oil supplies of the Arab world during Operation Desert Storm.

Since 1973, the ethanol and renewable fuels industries have made enormous strides. But it is still a fledgling industry,

dependent upon the market for gasoline additives and questions of air quality. While these topics are critically important, our first priority should be to slow the growth of our dependence upon foreign oil imports.

I strongly support the approach of the Democratic Leader, Senator Daschle. His call for a renewable fuels standard centers the debate foursquarely where it should have been all along. I welcome the recent announcement by the Administration that it is also supporting the creation of a renewable fuels standard. I am aware that there will be many who will oppose such an approach, in part because it imposes requirements upon the free market distribution of fuels and related products.

I would point out, however, that the various clean air standards also interfere with the free market, and we are discussing the oxygenate requirements only because MTBE has contributed to environmental problems, in addition to alleviating them. Furthermore, Senator Daschle's draft legislation includes a free market mechanism – the use of trading to allow for the buying and selling of credits among refiners, blenders, and importers throughout the country. These types of trading

systems have been enormously successful in reducing costs of compliance in other areas, most notably in the Acid Rain SO2 trading program.

The other topic before us today concerns the environmental impact of MTBE upon groundwater. It would appear that the wolf is at the door, and MTBE will be phased out in the next few years. Many in the ethanol community welcome this, assuming that ethanol is the only logical and available substitute. However, I must forewarn my colleagues that if the wolf is at the door, it may be a wolf in sheep's clothing, for it is not clear how this will impact ethanol.

It appears that California refineries may be able to meet clean air emissions requirements without any use of oxygenates, including ethanol. This is still subject to debate, and Senator Daschle's approach will put the feet of the California refineries to the fire, so to speak, for they will not be allowed to slide backwards, and increase air emissions related to ozone precursors or toxics.

Nonetheless, it may not be wise to simply ban MTBE, on the questionable assumption that ethanol will take its place in virtually all markets. Such an approach could well tie the future of ethanol to a hollow shell, with the result that we could be left without an oxygenate standard, and without any need for ethanol at some California refineries. If that scenario were to occur, the real wolf would be at the door, only this would be the very animal that has grown inexorably in size and ferocity over the last thirty years – namely an even greater increase in foreign oil imports. It is therefore critically important that Senator Daschle's bill ties any waivers of the oxygenate requirement to a renewable fuels standard.

Senator Daschle's approach would allow the governor of each state to apply to the EPA to waive the RFG oxygen content requirement. This approach is clearly preferable to the "one size fits all" top-down approach of the Administration, which would eliminate the oxygenate requirement on a national basis. Those states that would prefer to continue the standard should be allowed to do so. And if an oxygenate requirement proves necessary, then ethanol is the additive of choice to meet clean air standards.

In closing, Mr. Chairman, I am concerned that without a renewable fuels standard, some states may choose to waive the oxygenate requirement, with the result that oil imports will rise to fill the gap left by MTBE. This is not insignificant, for MTBE represents three billion gallons of total gasoline consumption. Our challenge is to find a way to protect our environment, while reducing our dependence on foreign oil. We must do so before we face yet another oil-related national emergency, as occurred more than thirty years ago at the dawn of ethanol, with the first oil embargo.

Pete G. Fitzgerald

Statement of Senator Peter G. Fitzgerald
Agriculture, Nutrition and Forestry Committee Hearing
MTBE Crisis and the Future of Renewable Fuels
Tuesday, April 11, 2000

Good morning. Mr. Chairman, I appreciate you scheduling this hearing on an issue of importance to every citizen but especially my home state of Illinois.

I have become deeply concerned by the use and ultimate misuse of the gasoline additive methyl tertiary butyl ether (MTBE), a nonrenewable fuel derivative, and its potential adverse health effects on those who come in contact with it.

As many of you know, on March 9th, I introduced the "MTBE Elimination Act" with my Colleagues Senators Bayh, Abraham, Kohl, Grassley, Durbin, Brownback and Grams to address this issue. Specifically, this bill will phase out MTBE use across the United States over the next three years, ensure proper labeling of all fuel dispensaries containing MTBE enriched reformulated gasoline, provide grant awards for MTBE research, and express the sense of the Senate that the Administrator of the Environmental Protection Agency should provide assistance to municipalities to test for MTBE in drinking water sources, as well as provide remediation where appropriate. This bill represents an important first step toward nationwide safe and healthy drinking water.

Despite the potential damaging effects of MTBE, research of this chemical is still in its preliminary stages. In February of 1996, the Health Effects Institute reported that MTBE could be classified as a neurotoxicant for its acute impairment effects on humans. Further, the Alaska Department of Health and Social Services and the Centers for Disease Control from December 1992 through February 1993 monitored concentrations of MTBE in the air and in the blood of humans. These studies showed that people with a higher concentration of MTBE in their bloodstream have a much greater tendency toward headaches, eye irritation, nausea, disorientation, and vomiting. Finally, the January 16, 2000 broadcast of the "60 Minutes" show noted, "the EPA's position is that MTBE is a possible human carcinogen." Mr. Chairman, we must remove this kind of chemical from our Nation's drinking water supply.

Widespread pollution of water systems by MTBE has been perpetuated by a lack of knowledge, as well as indifference, to this potentially hazardous substance. MTBE does not readily attach to soil particles, nor does it naturally biodegrade, making its movement from gasoline to water extremely rapid. The physical properties of MTBE, coupled with its potential adverse health effects, make the use of this specific oxygenate dangerous to the American people.

The elimination of the use of MTBE in reformulated gasoline should not mean the removal of the oxygenate requirement set forth under the Clean Air Act of 1990 – which requires reformulated gasoline to contain two percent oxygen by weight. I believe it to be reasonable for our nation to expect both clean air and clean water, without having to eliminate the reformulated gasoline market or sacrifice our national health.

According to the United States Department of Agriculture study entitled "Economic Analysis of Replacing MTBE with Ethanol in the United States," replacing MTBE with the oxygenate additive ethanol would create approximately 13,000 new jobs in rural America, increase farm income by more than $1 billion annually over the next ten years, and reduce farm program costs and loan deficiency payments through an expanded value-added market for grain. Furthermore, the U.S. Department of Agriculture has concluded that within three years, ethanol can be used as a substitute oxygenate for MTBE in nationwide markets without price increases or supply disruptions.

Ethanol has proven to be a viable, environmentally-friendlier alternative to MTBE. The Chicago reformulated gas program (RFG) has used ethanol for years, and according to the American Lung Association, Chicago has established one of the most successful RFG programs in the country. Ethanol is vitally important to my home state since Illinois is the number one producer of ethanol in the nation. Each year, 274 million bushels of Illinois corn are used to produce about 678 million gallons of ethanol. At a time when agricultural prices are at depression-era lows, this increased demand is sorely needed.

The MTBE Elimination Act will send a signal that the Senate strongly supports bio-based fuels research and recognizes the need to find viable ways to reduce our dependency on fossil fuels. Through research programs, localized testing, and proper labeling we can help assure that MTBE is properly identified in gasoline, extracted from groundwater, and phased out of use– thereby reducing the risk of future MTBE contamination.

Subsequently, the Clinton Administration recently announced they would seek to significantly reduce the use of methyl tertiary butyl ether (MTBE). I applaud their decision to join me and others in this worthwhile goal.

I am, however, very concerned that the Administration's proposal may weaken the Clean Air Act. The oxygenate requirement of the reformulated fuels program is a time-tested method proven to clean the air in our nation's smoggiest cities. Deleting this requirement—as the USDA and the EPA propose—without fully considering its implications may be ill-advised.

Americans should not have to choose between clean air and clean water. The legislation I have proposed will eliminate MTBE and retain the oxygenate requirement to protect our air. I believe ethanol is ready to replace MTBE as an environmentally-friendlier alternative in the nation's reformulated gasoline program.

The Administration's plan would cap the ethanol market at a bureaucratically-determined limit, doing nothing to enhance farm income. As I mentioned earlier, the Department of Agriculture's own analysis affirms that banning MTBE, in the method that the legislation I introduced requires, would increase farm income by $1 billion per year. This could lower federal farm program costs and help farmers who are experiencing extraordinarily low prices. Unfortunately, the Administration has chosen an approach that will allow and even encourage this important market to stagnate.

By phasing out MTBE over a three year period and replacing it with ethanol, as the MTBE

Elimination Act requires, we can help secure an ample supply of reformulated gasoline, clean water, and clean air for future generations. This bill enjoys bipartisan support, and I ask the Members of this Committee to join me in co-sponsoring this bill that is so important to the well being of the environment as well as our nation's farmers.

Mr. Chairman, I appreciate you holding a hearing on this important issue. I look forward to the testimony and discussion today.

Hon. Richard G. Lugar, a U.S. Senator from Indiana, Chairman, Committee on Agriculture, Nutrition, and Forestry

MTBE and Renewable Fuels

Date: 4/11/00

In July, 1999, an independent Blue Ribbon Panel on Oxygenates in Gasoline called for major reductions in the use of MTBE as an additive in gasoline. They did so because of growing evidence and public concerns regarding pollution of drinking water supplies by MTBE.

Evidence of water contamination by MTBE was highest in those areas of the country required to adopt (or which had voluntarily adopted) the Reformulated Gasoline Program established by the Daschle-Dole Amendment to the Clean Air Act. The RFG program was designed to reduce smog as well as air toxics and contained a minimum 2 % oxygen content to facilitate those reductions.

The Reformulated Gasoline Program was established by the Dole-Daschle Amendment to Clean Air Act, an amendment and an Act which I strongly supported, having participated in the meetings convened by Senator Mitchell, Senator Dole and the Bush Administration to draft clean air amendments which were strong, yet cost-effective. The Acid Rain provisions of the Clean Air Act have been a huge success, with the environmental economists at the independent and widely respected Resources for the Future estimating public benefits outweighing costs by a ratio of sixty six to one.

The Reformulated Gasoline Program (RFG) has also proven to be a success in reducing smog and has exceeded expectations in reducing dangerous and carcinogenic air toxics in gasoline. The second stage of the Reformulated Gasoline Program (RFG) will commence this summer and will have an even greater effect in reducing ozone pollution and air toxics.

A largely unanticipated effect of the Reformulated Gasoline Program was that MTBE rather than ethanol became the oxygenate of choice outside of the Midwest to meet the 2% oxygen requirement in the Reformulated Gasoline Program. The reasons why refiners have preferred to use MTBE as an oxygenate rather than ethanol are said to relate to issues of cost and transportation, but they also result from a natural preference by oil companies for a product which they themselves make (MTBE) rather than one which they purchase from others (ethanol).

Because of concerns regarding water pollution, it is clear that the existing situation regarding MTBE is not tenable. The Governor of California has called for a three year phase out of MTBE in California and the California Air Resources Board has adopted regulations to that effect. Environmental officials from eight Northeastern States have proposed a phase down and a capping of the use of MTBE in gasoline in their states.

Retaining the current oxygenate requirement for reformulated gasoline is certainly a viable solution. A USDA study has shown that it is technically and economically feasible to replace all of the MTBE currently used in reformulated gasoline with ethanol over a four year period. A study by the Governors' Ethanol Coalition has projected major benefits to rural economies, farm income and jobs if ethanol is allowed to replace MTBE as MTBE use is phased out.

Officials from California and the Northeast are requesting legislation to repeal or at least facilitate waivers of the oxygenate requirement. This alternative would sacrifice some of the energy security and economic benefits of increased ethanol use.

Senator Daschle has presented a compromise proposal which would allow for legislative authority to waive the oxygenate requirement provided that such authority was accompanied by strict anti-backsliding provisions regarding air toxics and a renewable fuels standard to ensure that markets for renewable fuels will continue to expand as a result of the MTBE crisis. He includes a biofuels credit in his draft legislation.

As concerns over energy security mount, there is growing recognition of the importance of adopting a national energy strategy which will address the development of alternative fuels. It is clear that MTBE is on its way out. The question is what kind of legislation is needed to facilitate its departure and whether that legislation will be based upon consideration of all of the environmental and energy security issues involved.

I look forward to the testimony of our well informed and expert witnesses.

# # #

Testimony
of

Governor Tom Vilsack, Iowa

Chair,
Governors' Ethanol Coalition

before the

Senate Agriculture Committee

Regarding Ethanol, MTBE and RFG

April 11, 2000

Introduction

Good morning Mr. Chair and Members of the Committee. Thank you for asking me to testify today about the future role of ethanol in the nation's reformulated gasoline (RFG) program. Today's record high gasoline prices and record low commodity prices underscore the need for expanded production and use of ethanol. As a domestically-produced renewable fuel made from agricultural products and biomass, ethanol can play a pivotal role in stimulating the economy of rural America by providing value-added processing options for grain. Domestic ethanol production also helps to reduce our dependence on imported oil, and lowers our vulnerability to future gas price hikes. Just as importantly, ethanol is a solution to many of the environmental concerns currently facing our nation.

I am Chair of the Governors' Ethanol Coalition, a group of 24 governors who support the increased production and use of ethanol thereby decreasing the nation's reliance on imported energy and creating a cleaner environment. The Coalition supports the production of ethanol from corn and other domestic, renewable resources using sustainable agricultural methods. And we encourage ethanol's use in all environmentally acceptable applications.

Let me begin by stating that as Governor of Iowa, the number one corn-producing state in the nation, I am a strong believer in ethanol. I have seen firsthand the positive impact ethanol has on local communities and the environment. In Iowa, we have worked diligently to develop ethanol production capacity because ethanol production provides new markets for agricultural products and adds value to these products through processing. The impact on our economy has been

tremendous. Ethanol production accounts for more than $730 million added to the value of Iowa's corn crop. More than 13,000 Iowa jobs are affected by ethanol, including 2,500 directly related to production. In fact, according to a 1997 report by Michael Evans from Northwestern University's Kellogg School of Management, the nationwide domestic ethanol industry:

- Boosts total employment by 195,200 jobs;
- Increases net farm income by more than $4.5 billion;
- Adds more than $450 million to state and local tax receipts;
- Improves the balance of trade by more than $2 billion; and
- Results in net federal budget savings of more than $3.5 billion.

Expanding ethanol opportunities is one part of a larger, long-term answer to expanding the farm economy. Farmer-owned cooperatives today produce nearly one-third of all ethanol production and are the largest growing segment of the industry. With today's low commodity prices, there is little profit in production, but there is profit and opportunity in processing.

In Iowa we also have a strong commitment to protecting and enhancing our natural resources. Balancing the needs of an agricultural economy with environmental sustainability is a continuous responsibility. But ethanol serves as a bridge toward that goal.

MTBE Water Contamination

I am here today to say that ethanol's benefits to the economy and environment are clear, and we must continue to advocate ethanol's role as a clean burning fuel in the reformulated gasoline (RFG) program. The RFG program with the oxygen requirement has resulted in air quality gains beyond the emission reduction goals in the Clean Air Act Amendments of 1990. According to the EPA, the emissions reduced from the use of RFG are equivalent to taking 16 million cars off the road each year.

There are two oxygenates widely used today, petroleum-derived MTBE and renewable ethanol. Unfortunately, the decision by a large number of refiners to use MTBE to satisfy the oxygenate requirement of the Clean Air Act has resulted in widespread water contamination across the country, most notably in California. Even in Iowa, where we are not required to use RFG and where MTBE is not currently used or sold, the Iowa Department of Natural Resources recently found that 29% of tested groundwater samples exceed the U.S. Environmental Protection Agency (EPA) health advisory level of 20 parts per billion. We were also surprised by the frequency of MTBE detection in the soil.

As states such as California move to phase out and eventually eliminate MTBE, we took the precautionary step of banning MTBE use in gasoline in Iowa last year. We must protect our citizens' drinking water supplies.

There is no excuse for sacrificing water quality for air quality. But, Mr. Chair, the problem is MTBE in water, not oxygen in gasoline. I believe that the optimal solution to the MTBE problem is replacing its use with ethanol. As states look for alternatives to MTBE to maintain the air quality gains of the Clean Air Act, ethanol provides a solution. In fact, with the expanded use of ethanol in the program, we can ensure both clean air and clean water, while providing an economic boost to rural America and reducing our foreign energy dependence.

Alternatives to MTBE

Oxygenates such as ethanol are added to gasoline to reduce emissions of carbon monoxide, volatile organic compounds, particulate matter, air toxics and nitrous oxides, and to displace toxics and aromatics. The end result is a reduction in harmful exhaust emissions and improved air quality.

There are concerns that if oxygenates are removed from gasoline they will be replaced by other harmful petroleum-derived products such as aromatics and alkylates. I am troubled by the possibility that we could end up putting more aromatics in gasoline, resulting in higher toxic emissions and pollution, when we have a clean-burning, renewable alternative that could guarantee the air quality benefits of the RFG program are maintained.

In January, the California Environmental Policy Council gave ethanol a "clean bill of health." The Council unanimously approved reports finding that the use of ethanol as a replacement to MTBE in the state's Cleaner Burning Gasoline (CBG) program would not have a negative impact on air quality, water quality, or public health. This action clears the way for ethanol to meet California's oxygenate demand.

In December, the Governors' Ethanol Coalition released a report confirming that ethanol is a safe, naturally-occurring substance that rapidly biodegrades and poses no threat to surface water or ground water. These findings are included in the report "*The Fate and Transport of Ethanol-Blended Gasoline in the Environment.*" This report was submitted to state officials in California who are struggling with the effects of MTBE. In California alone, more than 10,000 wells have been contaminated by MTBE.

The use of ethanol-blended RFG in the Chicago metropolitan area has achieved the clean air goals of the RFG program without negatively impacting precious water resources. Ethanol is an attractive option for states looking for alternatives to MTBE. Ethanol provides substantial air quality and economic benefits while meeting the goals of the RFG program.

In light of high gasoline prices, it is interesting to point out that the California Energy Commission determined that with a phase out of MTBE use, ethanol-blended fuel represents the least cost option and is less costly than the use of fuels containing no oxygenates.

Last fall, Governor Graves, then Chair of the Governors' Ethanol Coalition, and I signed a letter to Senator Daschle commenting on his proposed legislation to address the MTBE water contamination problem. In that letter, we endorsed the linkage of complementing the minimum oxygen standard with a national renewable fuels standard, as a means of providing selective flexibility to certain areas like California that have been particularly impacted by MTBE water contamination. Last fall, we urged Senator Daschle to modify his draft, so that the legislation would not impose a blanket repeal of the oxygen standard. We are pleased that Senator Daschle agreed with our suggestion, and that his most recent draft is consistent with that position.

Just last month, I issued a press release applauding the announcement of the Administration's principles addressing the MTBE problem. While I am encouraged by the EPA's decision to phase out MTBE, I also believe that it is imperative that a statutory requirement also be put in place that a percentage of all motor fuels be made from environmentally friendly ethanol. I believe that the renewable fuels standard meets this test, and would provide the ethanol industry, and our hard-pressed farmers, with a sustainable growth environment for years to come.

Ethanol Supply/Logistics

I understand that questions have been raised about the ethanol industry's ability to supply the market in the absence of MTBE. I can assure you that the ethanol industry can meet the increased demand for ethanol resulting from a phase out of MTBE. First of all, there is enough excess supply and underutilized capacity today to meet California's oxygenate demand.

Just a few weeks ago, the Governors' Ethanol Coalition released a report of current and future ethanol production, confirming the ethanol industry's ability to meet the nation's oxygen additive needs if MTBE is removed from gasoline. The report, "*Ability of the U.S. Ethanol*

Industry to Replace MTBE," concludes the U.S. ethanol industry has the ability to double ethanol capacity within two years and could produce 3.5 billion gallons a year by 2004, resulting in an excess supply of 313 million gallons more than will be needed to replace MTBE and meet all other current markets for ethanol.

Ability of the Ethanol Industry to Replace MTBE
(Million Gallons per Year)

	2000	2001	2002	2003	2004
Ethanol Demand	**1,343**	**1,781**	**2,231**	**2,693**	**3,168**
Current Production	1,533	1,533	1,533	1,533	1,533
Increased Use	0	180	180	180	180
Expanded Plants	0	420	839	1,049	1,049
Cap'y Under Construction		60	121	121	121
Cap'y Under Development	0				
		0	0	333	598
Total Supply	**1,533**	**2,193**	**2,673**	**3,216**	**3,481**
Surplus	**190**	**412**	**444**	**523**	**313**

The nation's 58 ethanol plants located in 19 states are well-prepared to meet the nation's immediate needs for an oxygen replacement to MTBE in gasoline.

The increased capacity for ethanol production will result from improved production efficiency leading to increased utilization of existing plants; expansion of existing facilities; new construction underway; and proposed facilities currently in various stages of development.

According to the report, six new plants in five states will begin production shortly. Twenty more grain-to-ethanol plants in 16 states, including Montana, New Jersey, Oregon, Texas and Washington, are being planned. An additional 12 plants using various organic wastes such as sweet potatoes, rice straw, wood and forest waste, and municipal solid waste in seven states, including Pennsylvania, California, North Carolina and New York, are also in the planning stages.

The study demonstrates the significant, positive impact the ethanol industry can have throughout the nation. When ethanol production reaches 3.5 billion gallons annually, 47,800 new jobs will have been created, many in areas where job creation is difficult. The non-ethanol production industries that will benefit include 2,300 new jobs in transportation, 1,300 new jobs in construction, 3,200 new jobs in the retail sector and 11,000 new jobs in service industries. These jobs will be scattered across the country. The study projects the industry's expansion will add $11.7 billion to real GDP by 2004 and increase household income by $2.5 billion.

Finally, the study concluded that there is no evidence of any material or construction constraints that would hinder the industry's ability to meet demand. As for concerns about adequate access to transportation of ethanol, a recent letter from U.S. Secretary of Agriculture Dan Glickman to Senator Harkin demonstrates that a number of transportation options are available for ethanol transport over the long term. The study, prepared by the Office of Energy Policy and New Uses in the Office of the Chief Economist, concludes there are no significant problems for ethanol transport if MTBE were to be phased out over a four-year period.

The evidence is clear that the ethanol industry does have the ability to meet the demand for oxygenated fuel as required by the Clean Air Act in place of MTBE and there is adequate access for transport of ethanol.

Conclusion

Given these factors, and in light of the vast economic and environmental repercussions associated with this issue, I support and recommend the following principles to be considered by this committee and the nation as a whole:

1. A nationwide phase out of the use of MTBE as a fuel additive within the next three years.
2. A requirement that fuel dispensing systems will be clearly labeled if MTBE is sold through those dispensers.
3. Support for research and remediation of groundwater contamination from MTBE.

4. The continuation of the 2% oxygen standard established in the 1990 Clean Air Act Amendments or a statutory requirement that ensures an equal or greater role for ethanol in gasoline.
5. Prevention of any reversal of emissions reductions gained thus far through the RFG program.
6. Establishment of regulations providing at least a .5 pound credit for reduction in carbon monoxide emissions realized from a 10% blend of ethanol in the Phase II RFG.
7. Encouragement for the production and use of renewable fuels as an oxygenate, an octane enhancer and as a replacement fuel for gasoline.

Mr. Chair, we have an opportunity today to lower our consumers' gasoline prices, reduce our dependence on imported energy, preserve water resources, provide a much-needed stimulus to rural America and maintain our air quality gains. We can achieve these goals by replacing MTBE with domestic, renewable ethanol. In order to attain these goals we must ensure a continued role for ethanol in the RFG program.

Maintaining a significant role for ethanol as MTBE use is phased out will ensure increased air quality and stimulate tremendous new economic development across the country, aiding our farmers who are in desperate need of new markets for their products. It will also encourage the development of ethanol production from biomass, enabling the production of ethanol from coast to coast, and making ethanol a truly national fuel.

Thank you.

TESTIMONY OF
ROBERT PERCIASEPE
ASSISTANT ADMINISTRATOR
OFFICE OF AIR AND RADIATION
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
COMMITTEE ON AGRICULTURE, NUTRITION
AND FORESTRY
UNITED STATES SENATE

April 11, 2000

Thank you, Mr. Chairman and Members of the Committee, for the invitation to appear here today. I am pleased to have this opportunity to share information with the Committee on the Administration's recommendations and plans to reduce or eliminate the use of methyl tertiary butyl ether (MTBE) and boost the use of alternatives like ethanol that pose less of a threat to groundwater. The Administration's response includes taking regulatory action to protect drinking water and working with you to implement the legislative principles we recently announced to protect drinking water, preserve clean air benefits, and promote greater production and use of renewable fuels.

My testimony today will focus on the Clean Air Act's Reformulated Gasoline (RFG) program which has provided significant air quality improvements, the growing concerns about MTBE contamination of water supplies and replacement of the existing oxygenate requirement in the Clean Air Act with a renewable fuel standard for all gasoline.

Last month, Administrator Browner and Secretary Glickman submitted to Congress legislative principles which, when taken together, will provide an environmentally sound and cost-effective approach:

- First, Congress should amend the Clean Air Act to provide the authority to significantly reduce or eliminate the use of MTBE. This action is necessary to protect America's drinking water supplies.
- Second, as MTBE use is reduced or eliminated, Congress must ensure that air quality gains are not diminished.
- Third, Congress should replace the existing oxygenate requirement in the Clean Air Act with a renewable fuel standard for all gasoline. By preserving and promoting continued growth in renewable fuels, particularly ethanol, this action will increase farm income, create jobs in rural America, improve our energy security, and protect the environment.

Cleaner Burning Reformulated Gasoline

An understanding of the history of the federal RFG program is important in order to put the issues surrounding the use of the oxygenates methyl tertiary butyl ether and ethanol in perspective. As you know, the Clean Air Act Amendments of 1990 put in place a number of programs to achieve cleaner motor vehicles and cleaner fuels. These programs have been highly successful in reducing air pollution. Congress struck the balance between vehicle and fuel emissions control programs after extensive deliberation. The RFG requirements also emerged as a program designed to serve several Congressional goals, including air quality improvement, enhanced energy security by extending the gasoline supply through the use of oxygenates, and encouraging the use of renewable energy sources.

The federal reformulated gasoline program introduced cleaner gasoline in January 1995 primarily to help reduce ozone or smog levels. Unhealthy smog levels

are still of significant concern in this country, with over 30 areas still in nonattainment of the current 1-hour ozone standard. More areas are expected to exceed the new, 8-hour ozone standard, should it take effect.

Ozone has been linked to a number of health effects concerns. Repeated exposures may increase susceptibility to respiratory infection, cause lung inflammation, and aggravate pre-existing respiratory diseases such as asthma. Other health effects attributed to smog exposures include significant decreases in lung function and increased respiratory symptoms such as chest pain and coughing.

RFG is an effective way to reduce smog precursors such as volatile organic compounds (VOCs) and oxides of nitrogen (NOx). The Clean Air Act Amendments of 1990 required that RFG contain 2.0 percent minimum oxygen content by weight. The first phase of the RFG program, from 1995 through 1999, required average reductions of smog-forming volatile organic compounds and toxics of 17% each, and NOx by 1.5%. In practice, phase I RFG, on average, exceeded these requirements for VOC, NOx and toxics reductions. This year, the second phase of the RFG program will achieve even greater average benefits: a 27% reduction in VOCs, a 22% reduction in toxics and a 7% reduction in oxides of nitrogen emissions. These reductions for RFG are equivalent to taking more than 16 million vehicles off the road. States rely on the air quality benefits of the RFG program to demonstrate in their State Implementation Plans (SIPs) that they can achieve the ozone standard. In fact, seventeen states and the District of Columbia currently rely on air quality benefits from the RFG program in their attainment SIPs.

The federal RFG program is required in ten metropolitan areas which have the most serious smog pollution levels. Although not required to participate, some areas in the Northeast, in Kentucky, Texas and Missouri have elected to join, or "opt-in" to the RFG program as a cost-effective measure to help combat their air pollution problems. At this time, approximately 30% of this country's gasoline consumption is cleaner-burning reformulated gasoline.

Neither the Clean Air Act nor EPA requires the use of specific oxygenates in RFG. The statute and, subsequently, EPA's regulations only specify the oxygen content by weight; they do not specify which oxygenate to use. Both ethanol and MTBE are used in the current RFG program, with fuel providers choosing to use MTBE in about 87 percent of the RFG mainly because of cost and ease of transport reasons.

Water Supply Concerns

Despite the air quality aspects of oxygenates in RFG, there is significant concern about contamination of drinking water by MTBE in many areas of the country including California, and Maine. EPA is very concerned about the widespread detection of MTBE in drinking water. Current data on MTBE levels in ground and surface waters indicate widespread and numerous detections of MTBE at low levels. The United States Geological Survey has found that the occurrence of MTBE in groundwater is strongly related to its use as a fuel additive in an area. Low levels of MTBE were detected in 21% of ambient groundwater tested in areas where MTBE is used in RFG compared to 2% of ambient groundwater in areas using conventional gasoline.

The Administration's Response

In response to concerns associated with the use of oxygenates in gasoline, the Administrator established a Blue Ribbon Panel of leading experts from public health and scientific communities, water utilities, environmental groups, industry, and local and state government, to assess issues posed by the use of oxygenates in gasoline. The Blue Ribbon Panel grappled with a number of complex issues, including an assessment of alternatives to the use of MTBE to ensure that current air quality benefits of RFG are continued and the additional benefits of the second phase of the program are not endangered. The Panel's recommendations to the Administrator fall under the following broad categories:

- Reduce the use of MTBE;
- Maintain current air quality benefits (no environmental backsliding);
- Prevent leaks through improvement of existing programs;
- Remediate existing contamination;
- Accelerate research on MTBE and its substitutes; and
- Amend the Clean Air Act to remove the requirement that federal reformulated gas contain 2% oxygen (by weight).

The Panel recognized that Congress, when adopting the oxygen requirement in 1990, sought to advance several national policy goals -- energy security and diversity, agriculture policy, among others -- that must be taken into consideration when addressing this complex issue.

EPA's has initiated a number of actions in response to the Blue Ribbon Panel's recommendations. This includes developing a secondary drinking water standard under

the Safe Drinking Water Act, establishing a water quality standard under the Clean Water Act, and enhancing underground storage tank program compliance to a 90% level in 2000. The Agency is currently funding a grant with the University of California-Davis to evaluate the effectiveness of leak detection technologies. EPA is also conducting a $1 million technology demonstration project for the clean up of MTBE contaminated aquifers. EPA continues to work with those cities and states that need help cleaning up existing problems. Remediation will be challenging, but essential. And we are working to develop and promote new cleanup technologies. We are also strengthening our efforts to make storage tanks more secure. In addition, where possible, we will work to provide more flexibility to states and refiners as they move to decrease the use of MTBE in gasoline.

The Administration's MTBE announcement and legislative principles are based on many of the Panel's recommendations. In addition to the legislative principles mentioned above, EPA has initiated a regulatory action aimed at reducing or eliminating the use of MTBE in gasoline. Under Section 6 of the Toxic Substances Control Act (TSCA), an Advance Notice of Proposed Rulemaking to ban or phase down MTBE from gasoline was signed last month. This action is the best regulatory mechanism available for limiting or eliminating the use of MTBE. TSCA gives EPA authority to ban, phase out, limit or control the manufacture of any chemical substance deemed to pose an unreasonable risk to the public health or the environment. The procedural burdens required by this statute, however, can be complex and time consuming. Therefore,

legislative action is our first priority and we want to work with Congress to address the issue.

Reducing or eliminating MTBE in no way diminishes the continued role for other oxygenates, such as ethanol, to control mobile source emissions. In addition, a significant role for renewable fuels is important to our nation's energy supply. Thus, the Administration recommends that Congress replace the two percent oxygenate requirement in the Clean Air Act with a renewable fuel annual average content for all gasoline at a level that maintains the current use level of renewable fuel (1.2 percent of the gasoline supply) and allows for sustained growth over the next decade.

Mr. Chairman, in closing, we intend to move forward with rulemaking under TSCA to significantly reduce or eliminate the use of MTBE. Congressional action, however, on the legislative principles I have discussed here is essential if we are to continue to achieve the public health benefits of cleaner burning gasoline while avoiding unacceptable risks to our nation's water supplies. We remain committed to working with Congress to provide a targeted legislative solution to this matter. Americans deserve both clean air and clean water and never one at the expense of the other.

This concludes my prepared statement. I would be pleased to answer any questions that you may have.

STATEMENT OF KEITH COLLINS
CHIEF ECONOMIST
UNITED STATES DEPARTMENT OF AGRICULTURE
BEFORE THE
UNITED STATES SENATE COMMITTEE
ON
AGRICULTURE, NUTRITION, AND FORESTRY

April 11, 2000

Mr. Chairman and Members of the Committee, thank you for the invitation to discuss the Department of Agriculture's (USDA) efforts related to the use of renewable fuels. I will discuss briefly our program on bioenergy and bioproducts, the role of ethanol in U.S. agriculture and some limited analysis we have done on the effects on agriculture of replacing MTBE with ethanol. USDA's activities related to renewable fuels include monitoring biofuels in energy markets and U.S. agriculture; conducting analysis on opportunities for agricultural products as alternative fuels; and performing scientific and applied research and other activities to advance biofuel technology and reduce conversion costs.

The Energy Challenge for U.S. Agriculture

U.S. agriculture is closely tied to developments in energy markets because it is a big user of energy directly as fuel, oil and electricity, and indirectly through manufactured inputs, such as chemicals. High energy prices can impose a financial burden on many farmers by raising their production expenses. But, agriculture is also a producer of energy, primarily in the form of ethanol, and in that capacity, increased demand for gasoline provides opportunities for new markets for domestically produced renewable energy.

The recent spike in crude oil prices has drawn attention to these dual effects for agriculture. While agricultural production has become much more energy efficient over time, with energy use (excluding electricity) falling by 25 percent between 1979 and 1993, farm

production expenses on energy are still substantial. Our most recent analysis suggests producers may spend $2-2.5 billion more on fuel and oil this year than the $6.4 billion spent in 1999. Fuel and oil costs as a share of total production expenses will likely be the highest since 1986. Little change is expected in electricity, chemical or fertilizer expenses. Crop producers are expected to face higher energy costs than livestock producers, although little effect on farmers' expected planted acreage this year is evident in USDA's March 31 *Prospective Plantings* report.

The potential vulnerabilities of the farm and U.S. economies to oil price increases are raising interest in renewable fuels. Other factors increasing attention include the challenge posed by President Clinton's Executive Order (E.O.)13134 to triple the nation's use of biobased products and bioenergy by 2010; water contamination problems caused by MTBE; the administration's legislative principles to reduce or eliminate MTBE and replace the oxygenate mandate with a renewable fuels standard; congressional legislation supporting renewable fuels; and the positive effects of renewables on a range of environmental variables, such as greenhouse gas emissions.

USDA Activities in Renewable Energy

USDA's Biofuels Program is part of a broader administration effort to promote bioproduct and bioenergy markets. Biofuels include starch and cellulosic ethanol, biodiesel from agricultural oils, and biomass for electric power. The program goal is to increase the use of renewable agricultural resources as biofuels, thereby creating jobs and economic activity in farm and rural areas, reducing dependence on imported oil, and reducing pollution. The Department devotes $9 million annually to biofuels research. In addition, USDA devotes $63 million annually to research on new industrial uses of agricultural products. The Department's biofuels and new uses programs are designed to support the objectives of the Energy Policy Act of 1992,

the Clean Air Act Amendments of 1990, E.O. 13134, as well as the administration's activities related to global climate change and sustainable development.

Current State of the U.S. Ethanol Market

The total amount of energy consumed in the United States this year is projected to be about 98 quadrillion btus (quads). Most of the biomass energy consumed is in solid form and used for direct combustion in industrial and residential applications. Total biomass wood energy accounts for 2.6 quads. Ethanol is the only liquid biofuel produced in significant quantities, accounting for only 0.14 quads. However, even that small amount has a significant impact on the farm sector.

There are more than 55 ethanol plants in operation in nearly 20 states with a total production capacity of about 1,800 million gallons per year (MGPY). In addition, plants with an estimated 145 MGPY are currently under construction and 400 MGPY is currently proposed for financing and planning.

Individual plant capacities vary from less than one MGPY to more than 300 MGPY. Among producing states, Illinois ranks first with ethanol plants totaling more than 600 MGPY combined production capacity. Iowa, ranks second, with about 500 MGPY capacity; Nebraska ranks third, with more than 300 MGPY capacity; and Minnesota ranks fourth, with more than 200 MGPY capacity. More than 50 percent of the ethanol production capacity converts corn to ethanol using the wet milling process, with the remainder using the dry milling process.

Ethanol production increased from a few million gallons in late 1970's to about 1.5 billion gallons in 1999. Production during the year shows considerable seasonality. Ethanol production is higher during October through March than during April through September. High

fructose corn syrup is produced during the summer by wet mills. Most recent data show ethanol production at a record-high 108,000 barrels per day during February 2000.

Corn today accounts for 90 percent of all feed stocks used in production of ethanol. Other feed stocks include sorghum, wheat, and processing wastes containing sugar and starch. Corn use in ethanol production has increased from 35 million bushels in 1980/81 to 550 million bushels expected during 1999/2000.

One gallon of ethanol has 35 percent oxygen with a 115 octane rating. These properties have given rise to three markets for ethanol: an octane market for use in conventional gasoline, an oxygenate market for use in the winter time carbon monoxide program, and an oxygenate market for use in the Reformulated Gasoline Program in smog-prone areas. Last year, about 800 million gallons of ethanol were blended with conventional gasoline, about 400 million gallons of ethanol were used in the reformulated gasoline programs in Chicago and Milwaukee, and 300 million gallons were used during the winter season in the oxygenated gasoline program.

Two key factors supporting ethanol production today are the increase in oil prices and low corn prices. The 1999 corn crop was the fourth largest on record at 9.4 billion bushels and farm-level prices for the crop are expected to average $1.90 per bushel, compared with $2.52 per bushel averaged during the previous 5 crop years. High oil prices have led to high prices for gasoline and other refined petroleum products. These increases are making ethanol more competitive in octane markets where most ethanol sales have occurred in the past. If current law, programs and market conditions continued, including continued use of MTBE, USDA's long-term baseline projections indicate 770 million bushels of corn could be used to produce 1.93 billion gallons of ethanol by 2009/2010, the equivalent of 7 percent of U.S. corn production, compared with 5.8 percent during the 1999/2000 corn marketing year.

The increase in ethanol production is positive for U.S. agriculture. Two years ago, Senator Harkin requested that USDA answer the question: what would elimination of the ethanol industry mean for U.S. agriculture and the rural economy? The USDA responded with an analysis that set corn use in ethanol to zero beginning in 1998 and estimated the agricultural market effects over the ensuing 7 years. Corn cash receipts were estimated to decline $2.6 billion and net farm income by $1.3 billion per year during 1998 through 2005. Lower farm prices also reduce the value of farm exports. The decline in agricultural export value, combined with the increase in the import value of the oil needed to replace ethanol, were estimated to contribute $1.0 billion annually to the trade deficit during 1998-2005. U.S. employment was estimated to decline by 14,000 by the end of the period. These effects indicate the important role ethanol plays today in supporting the farm economy.

The role of ethanol in energy security has been questioned because of ethanol's small market share–a little over 1 percent of U.S. gasoline use–ethanol's competitiveness with fossil fuels, and its net energy balance. USDA's original study on the net-energy balance of corn ethanol released in July 1995 showed that it is positive. That is, the energy in ethanol exceeds the energy used to produce the ethanol. Since that study, technological innovations in corn production and ethanol conversion have reduced the energy required to produce corn ethanol. Corn yields have improved, and ethanol plants are rapidly adopting energy-saving innovations which reduce the energy required to convert corn into ethanol. Our most recent estimate of the energy ratio is 1.34, up from our 1995 estimate of 1.24. The new estimate indicates that the energy content of ethanol is 34 percent greater than the energy used to grow, harvest, and transport corn, produce ethanol, and distribute the ethanol. Analysis by the Argonne National

Laboratory evaluating climate change benefits shows that corn ethanol reduces greenhouse gas emissions by 30 percent relative to gasoline, gallon for gallon.

Lowering net feedstock costs and other costs associated with ethanol production would improve the competitiveness of ethanol as a fuel or fuel additive. Analysis published by USDA's Economic Research Service suggests that long-term technology improvement could reduce ethanol production costs by 9 to 15 cents per gallon. Our researchers believe that additional savings of 8 to 13 cents per gallon may be possible through coproduct development and process improvement.

To achieve such cost reductions, USDA research is targeting the following areas:

- Discovering microorganisms and enzymes that would more efficiently convert biomass and multiple sugars to ethanol, thus reducing the cost of ethanol production.
- Developing higher value coproducts to reduce net feedstock costs.
- Improving production systems and methods for harvesting, handling and storing biomass crops. Also, new varieties of biomass could result in more efficient conversion to ethanol and other biobased products.

Implications for Agriculture of Replacing MTBE with Ethanol

Last year, USDA was asked to advise the EPA's Blue Ribbon Panel on MTBE whether expanded ethanol production could replace MTBE and whether expansion of ethanol production would disrupt the agricultural sector or substantially increase retail food prices.

Our analysis assumed MTBE would be phased-out during 2000-2004 and the oxygen content requirement for reformulated gasoline would remain in effect. The analysis assumed a 4-year adjustment period is sufficient to enable ethanol production and distribution capacity to expand to meet the projected increase in demand. Ethanol transport by barge, rail, ocean vessels,

and trucks is expected in the longer term, when MTBE is phased-out. Initially, ethanol would likely be shipped by barge to the Gulf and distributed to fuel blenders through customary shipping channels. Over time, the movement of ethanol by rail would likely increase as more rail connections between ethanol plants and refiners are developed.

Our analysis did not address broader economic issues of the MTBE phase out and maintenance of the oxygenate requirement, such as the need for increased investment spending in production capacity, the effects on overall fuel costs, or the effects of a quicker phase-out period for MTBE. The USDA analysis focused on the effects on agriculture of expanded corn demand. The increase in ethanol use resulting from a MTBE phase-out was estimated to increase corn used for ethanol by over 500 million bushels per year by 2004. The increase in corn demand was projected to raise the average price of corn by 14 cents per bushel during 2000-2010. Farm prices rise for other grains, while soybean prices decline slightly due to competition in livestock feed markets from an increase in byproduct feeds production. With generally higher farm prices, U.S. net farm income was projected to average $1.1 billion higher during 2000-2010. Higher agricultural export value combined with the MTBE import value decrease would contribute a positive $1.3 billion per year on average to the U.S. balance of trade. The increase in farm and ethanol production was projected to create 13,000 jobs across the economy by 2010, with over a third of the new jobs created in the ethanol sector itself.

Implications for Agriculture of a Minimum Average Renewable Fuels Standard

Last month, the administration announced a legislative framework which includes three recommendations to be taken together. First, Congress should amend the Clean Air Act to provide authority to significantly reduce or eliminate the use of MTBE. Second, as MTBE is reduced or eliminated, Congress must ensure that air quality gains are not diminished. Third,

Congress should replace the existing oxygenate requirement with a renewable fuels standard for gasoline. USDA will work with other agencies to assess the impacts of potential legislation.

Last year, Senator Daschle requested that USDA evaluate the effects on the farm economy of an example of a minimum average renewable fuels standard. While strictly illustrative of many possible renewable fuel standards, the analysis helps gauge how an MTBE phase out with a renewable fuels standard would affect agriculture, compared with an MTBE phase out and the oxygenate requirement remaining in place.

The renewable fuels standard examined assumed fuels produced from renewable sources account for 1 percent of the nation's gasoline in 2001 and increase linearly to 2.5 percent in 2010. The analysis was limited to the gasoline market and the effects on the farm economy of increased production of ethanol from corn. The amount of ethanol used in any year is therefore a fixed, assumed percentage of total projected gasoline use with no adjustment for other factors which could affect ethanol use. Ethanol production from biomass would likely be small initially, but was assumed to increase over time with advances in cost-saving technology, providing added farm sector benefits.

USDA's illustrative analysis of a renewable fuels standard indicates that a standard can provide significant economic benefits to U.S. farmers by increasing the demand for corn used in ethanol and investment in corn-ethanol production facilities. With 2.5 percent of the nation's gasoline comprised of ethanol by 2010, U.S. corn ethanol production would increase from a baseline projection of 1.7 billion gallons in 2010 to 3 billion gallons. The price of corn was projected to be over 15 cents per bushel higher in 2010 and average 11 cents per bushel higher during 2002-2010 than in the absence of the fuels standard. With higher corn prices and greater

corn production, U.S. net farm income was projected to increase by $1.4 billion in 2010, and average $750 million higher per year during 2002-2010.

These results indicate that the same or greater general types and magnitudes of economic benefits to agriculture and rural areas that would come from a MTBE phase out with no waiver of the oxygenate requirement could be obtained with a properly specified renewable fuels standard in place of the existing oxygenate requirement. In addition, the renewable fuels standard would provide refiners more flexibility to produce gasoline to meet Clean Air Act requirements, thereby helping to hold down increases in gasoline production costs.

An Incentive Program for Bio-based Energy Production

In support of the President's Executive Order to stimulate use of renewable fuels and in response to low commodity prices, the Secretary of Agriculture announced on February 2, 2000, that USDA would initiate rulemaking to increase the production of biobased energy. Under section 5(e) of the Commodity Credit Corporation (CCC) Charter Act, the CCC is authorized to use its general powers to "...increase the domestic consumption of agricultural commodities by expanding or aiding in the expansion of domestic markets...". Drawing upon that authority, the Secretary has indicated plans to propose a rule that would have CCC issue payments to bioenergy producers who increase their production of bioenergy beyond their historical production level. The proposed rule is now in development.

Such a program could have a number of beneficial effects. First, it could provide additional demand for the agricultural commodities used as feedstocks in the production of ethanol and biodiesel, raising farm prices and income. Second, the program could encourage development of processing plants, mostly located in rural areas, generating rural jobs and income from value-added products. Third, encouraging increased production capacity of biofuels would

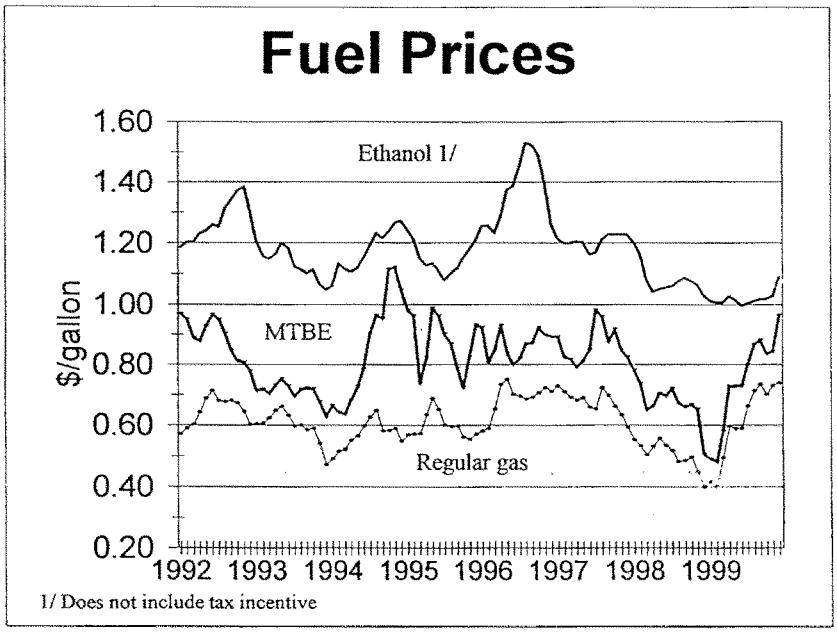
make an important contribution toward enabling the petroleum industry to phase out MTBE as an additive in oxygenated gasoline. Finally, increasing biofuels production at this time demonstrates our determination to more fully develop domestic energy resources.

Other Initiatives to Expand Bioenergy and Bioproducts

Key issues regarding the expansion of renewable fuels have been the level and types of Federal activities and the coordination among the various Federal efforts. Such concerns were addressed by S. 935, the National Sustainable Fuels and Chemicals Act of 1999; the administration supports the goals of this legislation and appreciates the Committee's leadership on this issue. USDA and other agencies have been making strong efforts to improve cooperation and coordination. As you know, that was an objective of the President's Executive Order (E.O.) 13134 on Developing and Promoting Biobased Products and Bioenergy. Federal agencies, under the leadership of USDA and the Department of Energy, are taking steps to meet the requirements of the E.O. and the accompanying Presidential Memorandum.

To coordinate these activities within USDA, Secretary Glickman established the Biobased Products and Bioenergy Coordination Council which Under Secretary Gonzalez chairs. Roger Conway, Director of the Office of Energy Policy and New Uses from my office, is the Vice Chair. The Council promotes biobased product research, development, and commercialization through information sharing, implementation of strategic planning and providing policy advice for the Department. It is also developing a list of biobased products for use by Federal agencies and their procurement officials as directed by E.O. 13101.

Mr. Chairman, that completes my testimony, and I will respond to any questions you or the other Members may have.


Fuel Prices
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1.40
1.20
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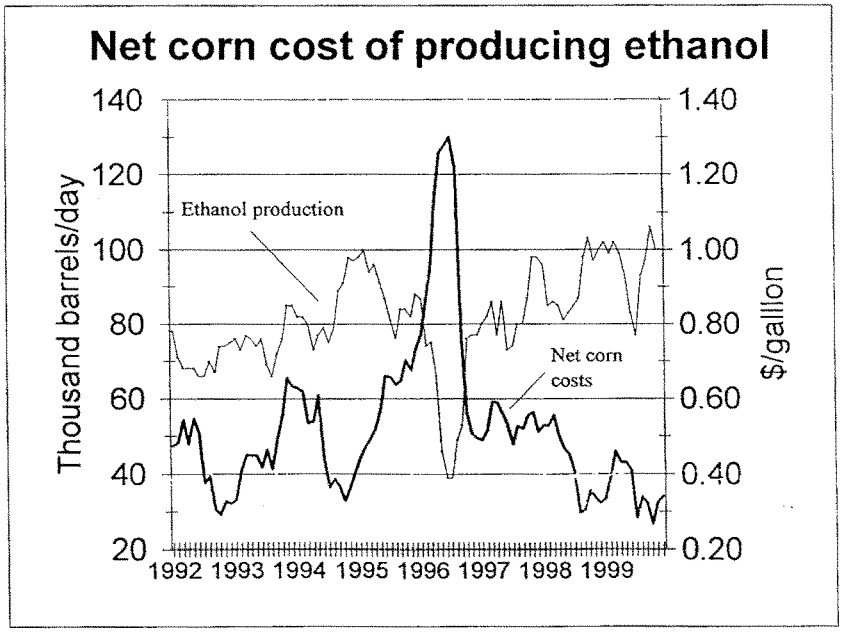
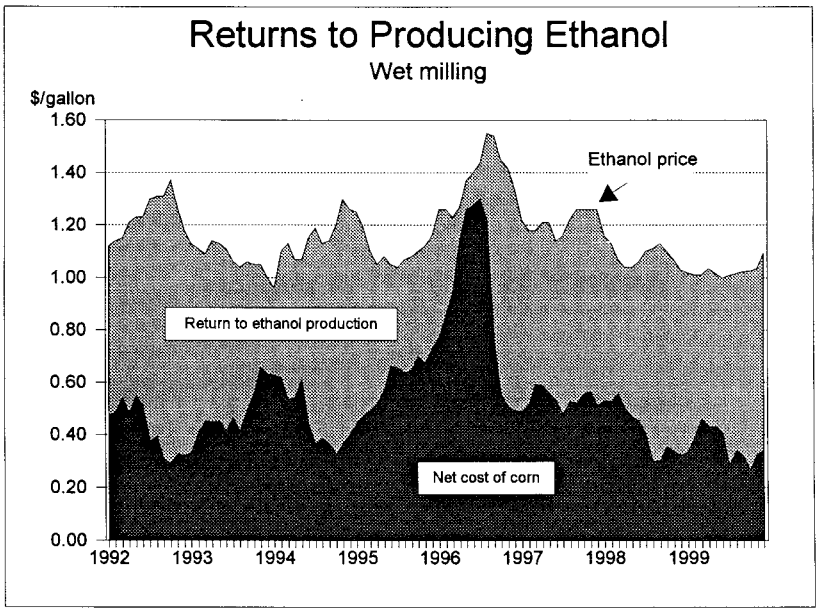
0.80
0.60
0.40
0.20
$/gallon
Ethanol 1/
MTBE
Regular gas
1992 1993 1994 1995 1996 1997 1998 1999
1/ Does not include tax incentive


Net corn cost of producing ethanol
140
120
100
80
60
40
20
Thousand barrels/day
1.40
1.20
1.00
0.80
0.60
0.40
0.20
$/galllon
Ethanol production
Net corn costs
1992 1993 1994 1995 1996 1997 1998 1999


Returns to Producing Ethanol
Wet milling
$/gallon
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1992
1993
1994
1995
1996
1997
1998
1999
Ethanol price
Return to ethanol production
Net cost of corn

Statement of

Dr. Mark J. Mazur

Director
Office of Policy

U.S. Department of Energy

Before

Committee on Agriculture, Nutrition and Forestry

United States Senate

April 11, 2000

Mr. Chairman, members of the Committee, I am pleased to be here to discuss the role that oxygenates like methyl tertiary butyl ether (MTBE) and ethanol play in the production and supply of gasoline, and how possible reductions in the use of MTBE and other changes in the Federal Reformulated Gasoline (RFG) program may affect the use of ethanol.

The Department's Analytical Focus

Over the last decade the Department of Energy has assisted the Environmental Protection Agency (EPA) in developing and implementing the RFG program and subsequent clean fuel rulemakings including ongoing efforts to develop a low sulfur diesel fuel requirement. The Department has done detailed analyses of the costs and refinery operational impacts of the various product quality regulations as well as broader fuel supply and pricing issues. More specific to this hearing, we have spent considerable time over the last year working with EPA and the Blue Ribbon Panel on Oxygenates examining the possible consequences of constraining the use of MTBE and modifying the statutory oxygenate requirements for the RFG program. Other analysis efforts related to the impact of changing oxygenate use have been carried out as part of the National Petroleum Council's ongoing Petroleum Refining study and by the Office of Fuels Development within the Department's Energy Efficiency and Renewable Energy Office.

In addition to these specific, focused analyses, the Department has the lead within the Administration for gathering and disseminating energy markets data, as well as producing analysis and forecasts of energy markets through our Energy Information Administration. As you are well aware, Secretary Richardson has taken the lead in responding to the widespread concerns about

high prices for crude oil, gasoline and distillate fuels seen in the past three months. In this regard, the Secretary has directed the Energy Information Administration and the Office of Policy to pay careful attention to the gasoline market, due to concerns that we could experience very tight gasoline supplies this year.

In addition to the work we do within the Department and the comments and analyses we have provided to EPA, we have asked the National Petroleum Council (NPC), a Federal advisory committee to the Secretary of Energy, to examine various issues related to environmental regulations and petroleum product markets. The NPC is now finishing its study on U.S. Petroleum Refining, which addresses the cumulative impacts of several product quality regulations, including changing the role of oxygenates in reformulated gasoline, on refinery viability and product deliverability.

Oxygenates and Reformulated Gasoline

This brings me to the subject of this hearing which is the role of oxygenates in reformulated gasoline production and the potential impact that limitations on MTBE may have on ethanol use and gasoline markets. The Federal Reformulated Gasoline program has been an air quality success with very few negative impacts on gasoline markets and consumers. There have been adequate supplies of RFG and its price has generally been only slightly higher than conventional gasoline. There are three main reasons for this. First, just a relatively small fraction of gasoline production is represented by RFG (about 25% of the total outside California) and there are a large number of refineries (about half of east coast, gulf coast and mid-west refineries) and importers

participating in the production of RFG. Second, the fungible nature of the gasoline allows the gasolines produced at the different refineries and going to different states to be mixed and exchanged. Third, refiners have significant flexibility to formulate the gasoline in different ways to match their refining capacity. While the statutory mandate to use a specified amount of oxygenate in RFG has been controversial, refiners have adapted to this and integrated MTBE and ethanol use into the economic production of their total gasoline pool.

Our analysis, and that of others, indicates that the current level of oxygenate use in the total gasoline pool is not far from the level of use that refiners would choose, at today's gasoline and oxygenate prices, even if there were no specific oxygenate mandate. This is largely because oxygenates like MTBE and ethanol are valuable blendstocks for producing clean, high performing gasolines. Under these circumstances, simply removing the oxygenate mandate would have little immediate effect on overall oxygenate use in gasoline other than allow some additional flexibility to decide where, within a refiner's total gasoline pool, these oxygenates are used. This is not to say the volume of MTBE or ethanol in any given gallon of RFG might not drop if the oxygen standard were removed. Rather, the total amount of MTBE and ethanol used in the Nation's gasoline supply would stay about the same in the short run if the oxygenate mandate were removed, based on the economics of the products involved.

As refiners face additional requirements to meet tighter environmental standards for gasoline, like the recently promulgated standards for Tier 2 low sulfur gasoline, they will find oxygenates such as MTBE and ethanol even more valuable to make up for lost volume, octane, and other property

changes. The availability of oxygenates also provides valuable immediate gasoline blending flexibility to refiners trying to meet tight product specifications: the oxygenates are aromatic-free, high octane, virtually sulfur-free blendstocks that can be put in almost any shipment of gasoline to offset performance shortfalls in other parts of the refinery. This is particularly true for MTBE which can be blended at the refinery and shipped in pipelines and which has little negative impact on vapor pressure. The effect of being able to readily blend even small amounts of MTBE into gasoline is to help assure product deliverability, reliable supplies and affordable gasoline prices to consumers.

Oxygenates can also provide important energy security benefits by increasing the gasoline supply and bringing non-petroleum and renewable feedstocks into the overall mix of refinery inputs. To the extent that these oxygenates come from non-petroleum and domestic sources, and the large majority of oxygenates we now use does come from domestic sources, they have the added benefit of displacing imported oil or imported products.

Addressing Problems Associated with MTBE

We share the concerns expressed by many over the impact of MTBE on water quality. The Administration is responding to these concerns with a number of actions including recommendations to Congress in the form of "Legislative Principles For Reducing or Eliminating MTBE". The key elements of these recommendations are:

- a gradual phase down or elimination of MTBE use in gasoline;
- ensuring that RFG air quality gains are not diminished; and

-replacing the reformulated gasoline oxygenate requirement with a renewable fuel standard for all gasoline.

This last point is particularly important from the standpoint of assuring adequate gasoline production. Reducing or eliminating MTBE with or without an RFG oxygenate requirement will increase, not diminish, the continued need for high quality blendstocks such as ethanol, in the production of clean, good performing gasoline in the needed volumes at affordable prices.

Avoiding Potential Problems

As we work together to develop the details of a program to reduce MTBE use and to increase the use of renewables, it will be of the upmost importance that we move deliberately and carefully so that we do not create gasoline supply and price problems or any other unintended consequences. We are operating in a tight gasoline supply/demand situation this year. The significant new investments required to meet the low sulfur gasoline regulations and other possible regulations affecting gasoline and diesel fuel, including reduced use of MTBE, combined with continued rising gasoline and diesel fuel demand make it likely that the motor fuel supply/demand balance in the U.S. may remain tight for the foreseeable future.

Current gasoline demand is almost 8.5 million barrels per day, a record level. The Energy Information Administration is forecasting more than 1.5 million barrels per day growth in gasoline demand over the next ten years (about 1.7% per year increase in demand) and they expect that gasoline imports will have to rise roughly 3/4 million barrels a day by 2010 to help meet that

demand growth.

It is in this context that we must find a way to reduce or eliminate over 280,000 barrels a day of MTBE use, which is equivalent to a loss of up to 400,000 barrels a day of gasoline production (due to the valuable characteristics of MTBE). This is a large volume-- about 4% of U.S. gasoline supply and equivalent to the output of four or five large refineries. To accommodate these changes will require substantial additional investment in refineries and ethanol production capacity and significant additional work by the engineering and construction industry. This issue is of concern and is being addressed in the National Petroleum Council study which will be complete in June of this year.

We want and need to work with Congress to develop legislation that is consistent with the Administration's Legislative Principles and recognizes the practical limitations to making a large number of changes in industries that will face significant uncertainty about new technologies and demand growth. A well-measured approach gives us the best chance of preserving a reliable gasoline supply thus avoiding price volatility, and maximizes the opportunity for biomass-based ethanol to participate in this market growth. Given enough time, the fuel supply industry can respond to the loss of MTBE. Clearly, increased use of ethanol, mandated or not, will play an important role. However, what is not so clear is the speed and degree to which refiners can or will make up the loss in volume and quality of gasoline given all the other demands on their resources, the uncertain market conditions, and the continuing growing demand for all petroleum products.

Also, it is not clear how fast and under what conditions ethanol production can or will expand. It will take more than a simple expansion of ethanol plant capacity for ethanol to become a major component of the fuels markets. In addition to building enough production capacity to meet expected demands on a reliable basis, better, lower cost transportation links , extensive terminal blending and quality control capability and capacity to hold significant inventory will be necessary. Providing some degree of certainty, sequencing these changes with the other changes, and moving deliberately enough so that producers and markets can adjust will be important to the success of this transition.

Biomass-based Ethanol Development

The major renewable fuel currently used in this country is ethanol from the starchy parts of corn, i.e., kernels. Corn ethanol production is approximately 1.5 billion gallons per year and represents a little less than 1 percent of the energy of our annual gasoline consumption.

Biomass ethanol refers to ethanol derived from cellulosic matter that is available on a renewable or recurring basis including agricultural and forest residues, the organic components in municipal solid waste, and future energy crops such as fast growing grasses and trees. The cost of producing cellulosic ethanol – currently about $1.10 to $1.25 per gallon for low-cost niche feedstocks – is in the competitive range with corn ethanol. DOE's Biofuels Program focuses on research and development aimed at lowering further the production costs of cellulosic ethanol so that a major domestic transportation biofuel industry can be established. The Department's Transportation Biofuels FY 2001 budget is $54 million, a substantial increase over the FY 2000

appropriation. The request includes stepped up R&D to develop cost-effective technology for breaking down cellulose into simple sugars, which could be used to manufacture ethanol and other higher value chemicals.

The nation is endowed with plentiful biomass resources. To illustrate, just corn stover, i.e., the biomass residues associated with the harvesting of corn, constitutes a sizeable supply of cellulosic feedstock for a domestic biofuel industry. Even after subtracting the amount of residues that should be left in the field for erosion control and soil nutrients, approximately 7 billion gallons of ethanol per year could be produced using the stover. Other residues, including municipal solid wastes, wheat straw, and waste wood from forest thinning operations, could also supply a growing biofuel industry. Furthermore, future plantations of biomass dedicated to fuel production would produce specialized grasses and trees as reliable feedstock supplies for the ethanol industry.

As an example of the progress being made, BCI Corporation's project in Louisiana is expected to result in a cellulosic ethanol plant operating by 2003 and producing 23 million gallons per year of ethanol. The state of Louisiana and domestic and foreign biotechnology and engineering firms are contributing to the financing package. A major engineering firm has reviewed the technology and issued a legally binding guarantee of the process economics, a prerequisite for closing the financing arrangement.

From this developing cellulosic ethanol technology base we could see significant growth in cellulosic ethanol production on the order of over 1 billion gallons a year by 2010, if there is a

reliable market for the ethanol. It is fairly clear that overall ethanol use could increase several fold by 2010 depending on the circumstances. For example, replacing MTBE on an oxygen content basis with ethanol would require more than twice current ethanol production levels. Replacing MTBE on a gallon-for-gallon basis would result in ethanol demand four times current levels. Obviously, the specific nature of the restrictions on MTBE use, the possible elimination or modification of the oxygenate requirement for RFG, and the size and nature of the renewable requirement will be key determinants of ethanol use. Other factors that may affect ethanol use are ethanol prices (including the current excise tax exemption and tax credit), the total demand for gasoline, the impact of sulfur controls on gasoline octane and volume, and gasoline prices. Any estimates of future ethanol demand will have to be viewed in the context of what assumptions are made about these factors.

Summary

MTBE getting into water supplies from leaking underground storage tanks and gasoline spills represents a serious problem that we propose addressing through the recommendations contained in the Legislative Principles and other actions. We want to work with Congress to develop legislation that fully addresses this problem while protecting American motorists from unnecessary gasoline price increases or price volatility and providing the best opportunity for growth in biomass based ethanol production.

Thank you for the opportunity to present this testimony. I will be glad to answer any questions you may have.

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Statement of

Trevor T. Guthmiller
Executive Director of the American Coalition for Ethanol

Before the Senate Committee on Agriculture, Nutrition and Forestry
April 11, 2000

Thank you, Mr. Chairman, members of the committee. My name is Trevor Guthmiller, and I am Executive Director of the American Coalition for Ethanol (ACE) in Sioux Falls, South Dakota. ACE is a grass-roots, non-profit ethanol advocacy group formed in 1988, with membership comprised of ethanol producers, commodity organizations, rural electric cooperatives along with businesses and individuals who support increased ethanol production and use. We greatly appreciate this opportunity to comment on the relative merits of proposals to deal with the MTBE water contamination problem, the importance of the oxygen standard in reformulated gasoline (RFG), and of the need to provide sustainable growth opportunities for ethanol over the mid- to long-term.

Mr. Chairman, the ethanol industry has been very fortunate over the years to have had the bipartisan support of many members of Congress including yourself. You have been one of the ethanol industry's most articulate spokesmen, and have effectively promoted expanded ethanol production and use since the industry's inception in the late 1970s. Ethanol's bipartisan supporters include all the other members of this Committee as well, both Republican and Democrat. The entire ethanol industry and America's grain producers owe all of you a great deal.

In the interests of time, Mr. Chairman, I would ask that my full written testimony be submitted into the record. I would then like to briefly summarize the ACE position in the remaining few minutes.

To begin, Mr. Chairman, ACE believes that the Daschle-Dole-Harkin reformulated gasoline (RFG) provision in the Clean Air Act Amendments of 1990, which established the minimum oxygen standard in reformulated gasoline, has been a great success. With your strong support, and that of many members of this Committee, the Daschle-Dole-Harkin provision was adopted by the Senate by an overwhelming 69 - 30 vote. That was ten years ago. The ethanol industry has grown, but we are again at a crossroads due to the problems caused MTBE, which is putting the future of the reformulated gasoline program and the oxygen requirement in jeopardy.

The oil industry, which is in business to make money, will not incorporate ethanol into their product mix unless there is some external mechanism requiring them to do so. Congress can create all the incentives it wants for increased ethanol production, but without some sort of demand mechanism the oil industry will never use it. That would be a loss for the entire country. When those demand mechanisms have dual purposes, and dual benefits, like an oxygen requirement that creates demand for ethanol, while helping achieve cleaner air, or a renewable fuels standard that would create demand for ethanol while at the same time help us reduce our dependence on imported oil, we all win.

Knowing that we have a great product, we still must deal with the reality that the petroleum industry, essentially both our customer and our competitor, controls the entire fuel infrastructure our product is distributed through, and if they didn't have to use ethanol to meet certain clean fuel goals, they wouldn't use it. Cost is irrelevant to them since the customer pays the final cost regardless of what the product is, and they would much rather have the customer buy their petroleum product versus our ethanol product.

It is good for our country to require the use of fuels other than petroleum if they are able to be incorporated into our transportation infrastructure with little or no cost to the consumer. Ethanol meets that test. The question then becomes, how do we best incorporate a growing ethanol industry into our national energy policy.

To answer that question we need to look at what are the values of ethanol. First off, ethanol has value as an oxygenate. Adding ethanol to gasoline undisputedly reduces automotive emissions. This has value to areas of the country where automotive emissions lead to poor air quality. Our country and its taxpayers end up having to pay at least a portion of the healthcare costs associated with the health problems caused by poor air quality. If we can reduce those healthcare costs and provide for a better quality of life by using oxygenated fuels in those areas, than we have an obligation to do so.

Ethanol also has value as a domestically produced renewable fuel that can be used to replace an imported fossil fuel. Currently, our government and our gasoline supply industry place no value on substituting a fossil fuel for a renewable fuel. With high gas prices as the result of our increasing reliance on imported oil, the time to consider charting a course that will result in the greater use of domestically produced renewable fuels like ethanol and biodiesel is now.

Our energy and economic health is jeopardized by our dangerous reliance on imported oil. The high prices that consumers are now being forced to pay at the pump will undoubtedly have an impact on our economy in many ways. The fact is that many billions of dollars are now leaving our country to go to pay for oil that comes from other parts of the world. Once that money leaves our country it does not contribute to our economy, it does not circulate, it does not create any jobs and it doesn't help fund our government or our schools.

With ethanol, on the other hand, the money that is used to pay for ethanol stays in our economy, much of it returning to the farmers who have invested in cooperatives that built ethanol plants. That money creates jobs in rural areas, and it stays in our economy and circulates, helping to fund schools and essential government services. Using ethanol is a no-lose proposition for our country.

There are still many myths and misconceptions about ethanol and the ethanol industry. We will not be able to address them all here today. The fact is, however, that ethanol is a great product that works well in all of our automobiles up to the 10% blend level. In fact, we believe our government should allow amounts greater than the 10% currently used, to be sold for use in all automobiles. Brazil has found that ethanol blends between 20% and 30% ethanol work well.

The decisions that the EPA and Congress will make in the next few months will potentially determine whether this industry goes forward or falls backward. We literally have our fate in your hands. Last week I spoke at the groundbreaking of a new ethanol plant near the small town of Wentworth, South Dakota. Approximately 975 farmers, with the help of the local rural electric cooperatives and the South Dakota Corn Utilization Council, invested their money in that project which will one day turn the low value corn they grow into high value ethanol. The investment they made was not only in that plant, but also in the good will of the United States Congress, since it was Congress that wisely created the reformulated gasoline program and the requirement that oxygenated fuel be used in that program.

There are many who do not understand the personal investment that thousands of family farmers have made in cooperative ethanol plants. They will say the answer is just getting rid of the reformulated gasoline program's oxygen requirement, or to allow states to opt out of the oxygen requirement with no consideration given to the loss of markets or potential markets for ethanol. That is not the answer. Two of my board members, John Carruth and Audrey Swanson, are farmers from Minnesota who have no connection to the ethanol industry other than the fact that they invested some of their family's money in a farmer-owned ethanol plants. They represent over 12,000 individual farmers in Minnesota, South Dakota, Iowa, Nebraska and Missouri, to name a few states, who have invested in ethanol plants. Those are the people we must remember and think about when decisions that will affect the future of the ethanol industry are made.

Let me say this very clearly – farmers did not create the problems associated with the use of MTBE, and they should not be made to pay the price for getting it out of our system. Eliminating the oxygen requirement is not the answer. Modifying it maybe, eliminating it is not. That is not the answer because it does nothing to reduce our dependence on imported fossil fuels, nor does it protect the investment of the farmers who have gotten together to build ethanol plants who were banking on there being a continuing market for their fuel. Nor does it help protect our air quality.

In his recent speech to the National Conference on Ethanol Policy and Marketing in San Francisco, Senator Daschle stated the obvious: if it is possible, the ethanol industry would prefer that the successful reformulated gasoline program with the oxygen requirement be maintained as it is, and ethanol use expanded to fill the gap left by the departure of MTBE. The outstanding success of the reformulated gasoline program with ethanol in the Chicago and Milwaukee areas provides the best evidence for this position.

However, ACE is also aware that there are many powerful interests who are strongly opposed to this approach, and who are demanding an elimination of the oxygen standard. Though we are highly skeptical of the oil industry's claims that it can produce equivalent "clean gasoline" without the use of ethanol or any other oxygenate, there are many people who are so frustrated with MTBE that they do not want to accept the status quo.

If it proves to be impossible to hold on to the oxygen requirement, or if it seems as though the oxygen requirement will be dismantled by the granting of waivers by the EPA, then we agree with Senator Daschle that a Renewable Fuels Standard (RFS) must be established to ensure the sustainable growth of the ethanol industry--both traditional grain-based, and emerging biomass technologies--well into the future. This would protect the investment of all the farmers who have bought shares in ethanol cooperatives, while at the same time paving the way for the continued growth in the ethanol industry.

I would like to briefly cite several highlights of Senator Daschle's proposal that ACE believes should be part of any legislation that emerges from the current debate.

- The oxygen standard should not be eliminated. If necessary, it should be modified to allow Governors the authority to petition the EPA for a waiver from the standard, while at the same time require them to adopt a renewable fuels standard for their state that will ensure the growth of ethanol use. RFG areas, like Chicago and Milwaukee, where the use of ethanol has been a huge success should be allowed to continue with their programs.

- Congress should allow Governors of former non-attainment, and attainment, areas to "opt-in" to the RFG program if they so choose. This would enable areas like Kansas City to cost effectively deal with their air pollution problems, yet expand the use of ethanol, and avoid water contamination risks posed by MTBE.

- If enacted, a renewable fuels standard should provide for assured, aggressive growth over the next four to eight years. Ethanol's value to the agricultural economy, environment, trade deficit, and as a job creator justifies this treatment. In the future, ethanol production and use will also enable the agricultural sector to cost effectively contribute to reductions in emissions of greenhouse gases linked to global climate change.

- Any renewable fuels standard must have strong enforcement and penalty provisions, and the Secretary of Agriculture must be involved in making any decisions concerning waivers of the requirement related to concerns over potential shortages of ethanol due to drought or other extraordinary occurrences.

- If enacted, a renewable fuels standard should include strong anti-backsliding language that will preserve the real-world gains made from the use of oxygenated fuels in RFG areas. To prevent refiners from increasing toxics an aggressive cap should be imposed on the level of aromatics in gasoline.

- A renewable fuels standard, if enacted, could also include credit-trading mechanisms, to provide flexibility for refiners, and protection for consumers.

- A renewable fuels standard, if enacted, should allow averaging the use of renewable fuels, but that averaging should be implemented on a quarterly basis, so as to prevent the forced buildup of stocks during the summer months, a requirement which would put an extreme financial burden on smaller, farmer-owned ethanol plants which have limited amounts of storage.

If it is politically feasible to hold on to the oxygen requirement in reformulated gasoline as MTBE is eliminated from use in the country, then that is what we would prefer happen. However, the reality is that that might not be possible, it is up to our leaders, like yourselves, in Congress to decide. Another reality is that the EPA may grant a waiver from the oxygen requirement to California, and should that be granted, the Northeast states would not be far behind in submitting their waiver application. The Governor of Missouri has recently asked the EPA to be let out of the RFG program because of his concern with MTBE.

If those waivers happen any chance of growth in the ethanol market becomes severely limited. And then, those 975 farmers who pooled together their own money to build an ethanol plant in Wentworth, South Dakota, who broke ground last week will be left without a market for their fuel. And any other farmer group out there that is looking at creating some extra income for their family through processing their corn into ethanol, including the 12 farmer-led groups who recently met in Iowa and are looking at ethanol plant projects, will most likely be stopped dead in their tracks. Protecting the oxygen requirement, or finding some other mechanism to promote the increased use of ethanol, is vital to the future of this industry – vital. Finding a solution is not a partisan issue, it is an agricultural issue and an economic issue, and it is a personal issue to all the farmers who have invested in ethanol plants.

One solution that has been tossed out is the concept of modifying the oxygen requirement so states that wanted to get out of it could, should they meet the requirements; but in lieu of opting out of the oxygen requirement in their reformulated gasoline areas, they would then have to opt into a renewable fuels standard. Such a plan would give states more flexibility in how the fuel is used, while at the same time protecting and preserving the market for ethanol.

We like this concept as well. Creating a value for ethanol as a renewable fuel and as an oxygenate would be beneficial for our industry. A standard that would require an increasing amount of renewable fuels in reformulated gasoline areas would help give farmers and others the certainty of increased demand so that they could invest in and build more ethanol plants. It would also hopefully pave the way for increasing the use of ethanol and biodiesel in diesel fuel. There are many values to our economy and our environment to increasing the amount of renewable fuels we use.

The United States Department of Agriculture estimates that replacing MTBE with ethanol in reformulated gasoline areas would increase the demand for corn for ethanol use by over 500 million bushels and would increase the price of corn by $.14 per bushel, which would increase total farm cash receipts by $1 billion annually. On top of that, we would then double the amount of petroleum the ethanol industry is currently displacing in our country. That's what we want to happen, the question is how do we best get there.

Any solution to this MTBE crisis that would at least ensure the doubling of the size of the ethanol industry, protect the investments of farmers in ethanol plants and preserve the air quality benefits achieved with the use of clean burning oxygenated fuels, would be something that we could support.

Mr. Chairman, ACE's membership commends you for convening this important hearing, and thanks you for your longstanding support of the ethanol industry. We urge you and your colleagues to continue the tradition of seeking bipartisan solutions to these very complex problems, and we pledge our resources to assist you and your colleagues in any way that we can. Thank you for your time.

Testimony of

Nathan Kimpel
President/Chief Operating Officer
New Energy Corp.

before the

Senate Agriculture Committee

Washington, D.C.
April 11, 2000

Good morning Mr. Chairman and Members of the Committee. I am very pleased to be here to discuss ethanol's continued participation in the federal reformulated gasoline program (RFG) generally, and the RFG oxygen content requirement specifically. I appreciate the opportunity to provide comments on behalf of the domestic ethanol industry.

First, let me tell you something about my company. New Energy Corp. was created as a direct result of the OPEC oil embargoes of the 1970's. When our plant was under construction from 1982 to 1984, oil prices were in the $28 to $32 a barrel range. All of us who went to work for New Energy in the early 1980's knew how important a domestically produced renewable fuel source would be in the future. All of those beliefs and their reasons are all still with us today.

New Energy is located in South Bend, Indiana. Our company employs approximately 138 people and contributes over 100 million dollars a year to the northern Indiana economy through purchases of raw material, goods and services, transportation, wages and taxes. Since our start up in 1984 we have produced almost 1.1 billion gallons of fuel grade ethanol and have consumed approximately 415 million bushels of corn. At an average price during this period of $2.50 a bushel, our company's presence represents an additional demand force in the northern Indiana agricultural market of over one billion dollars. New Energy became operational in 1984 after two years of construction and design work. Our plant was the first "green field" or ground up design large scale fuel ethanol plant to be built. Our initial design was to guarantee an annual production rate of 52.5 million gallons of fuel grade ethanol. Today our plant is operating at a rate of 85 to 88 million gallons a year.

Background:

Before turning to the RFG program, I would like to provide some perspective as to why ethanol is so critically important to the nation's economic, energy and environmental policies. One need only look at today's headlines to appreciate the need for increased production and use of fuel ethanol. With overall conditions in the farm economy in 2000 expected to be similar to last year and the nation facing record oil prices due to OPEC production cutbacks, ethanol production and use will play a pivotal role in providing value-added processing for grain while helping to constrain gasoline prices and promote competition.

At a recent USDA Agricultural Outlook Forum, USDA Chief Economist Keith Collins stated that the price for corn this year is "expected to average only $1.90 a bushel, slightly below the 1998 crop." With total supplies predicted to be near 1999 levels and little change in ending stocks, Collins noted that "corn prices are expected to show only modest improvement next season." Collins also predicted that in light of weak markets, substantial government payments will be made under current programs in 2000. The use of corn for ethanol production not only adds to the price of a bushel of corn, it also helps to reduce government payments.

At the same time, the Energy Department reports oil prices are at the highest levels since the Gulf War, and gasoline prices are expected to top $1.60/gallon this summer. Blending ethanol with gasoline provides an economically competitive source of octane, helping to constrain gasoline prices. As the Congress considers policies to moderate gasoline prices and assure fuel supplies, providing increased market opportunities for domestically-produced renewable energy, such as ethanol, should be a top priority. In fact, the farm income and energy security benefits of ethanol were principle factors leading to congressional approval of the RFG program and the oxygen content requirement in the Clean Air Act Amendments of 1990. Today's headlines merely reinforce the efficacy of that decision.

The Reformulated Gasoline Program:

First, I think it is important to underscore that the RFG program, *with* its oxygen content requirement, has worked quite effectively. Air quality has improved. Indeed, about 75 million people are breathing cleaner air because of RFG. EPA reports that RFG is reducing ozone-forming hydrocarbon emissions by 41,000 tons and toxic pollutants such as benzene by 24,000 tons annually. That's the equivalent of taking 16 million vehicles off the road each year. A study by the Northeast States for Coordinated Air Use Management (NESCAUM) shows that today's RFG reduces the cancer risk from gasoline by about 20 percent. It is critically important to recognize that these benefits are significantly greater than required by the Clean Air Act's performance standards for hydrocarbons and toxics, at least in part because of the federal oxygen requirement.

At the same time, the decision by refiners to use MTBE in most RFG has had a devastating impact on water quality. The U.S. Geological Survey reports that MTBE has been detected in 27 percent of urban wells nationwide. In RFG areas, where MTBE is more commonly used, the problem is more severe. MTBE is four to six times more likely to be detected in RFG areas than in conventional gasoline areas. USGS reports that 79% of the wells tested in Denver and 37% of the wells tested in New England had detectable levels of MTBE. Indeed, MTBE is now the second most commonly found chemical in groundwater, behind only chloroform.

Leaking underground storage tanks and spills at the land surface are important point sources for MTBE in the environment. But there are many other sources of MTBE water contamination. Potential non-point sources of MTBE include precipitation, urban runoff, and motor water craft. Once MTBE is in water it is expected to move between surface and ground water with the natural movement of water. Indeed, MTBE is very water soluble compared to the BTEX compounds and other components in gasoline; the solubility of MTBE is about 50,000 mg/L (milligrams per liter) whereas the next most soluble component of gasoline is benzene, which has a solubility of 1,780 mg/L. Therein lies the problem: if MTBE is in gasoline it will find its way to water where it is extremely soluble and will eventually contaminate drinking water supplies.

As a consequence of the growing concerns regarding MTBE water contamination, there is interest in amending the Clean Air Act and the RFG program to allow refiners to reduce or eliminate their MTBE use. Refiners claim they cannot eliminate their use of MTBE without the "flexibility" of producing non-oxygenated fuel and have sought the elimination of the oxygen requirement. The domestic ethanol industry has steadfastly opposed efforts which seek only to eliminate the federal RFG oxygen requirement or address the issue for particular states or regions. However, we do not want to hinder legislative efforts to address this serious public health and environmental issue. We want to be part of the solution, not part of the problem. Toward that end, we have developed the following principles which we believe should guide congressional action on this issue.

- Develop a national solution;
- Address the cause of the problem;
- Protect the environment; and,
- Provide the necessary time and "flexibility" to allow refiners to make a rational transition to increased ethanol utilization.

Develop a national solution.
Regional or state-specific actions will create a patchwork of fuel regulations resulting in increased consumer costs and will encourage MTBE use in areas not using MTBE today - expanding potential MTBE water contamination.

Approximately 4 billion gallons of MTBE are consumed in the United States today, with the vast majority of it used in RFG markets. Approximately one-third of the MTBE used is imported, either as a fuel blendstock or in finished gasoline. In the absence of a national MTBE control program, states will continue to take action phasing out MTBE. Already, California, Iowa and South Dakota have enacted MTBE controls. Missouri, Colorado, Wisconsin and several northeast states have MTBE ban bills pending. In the Congress, H.R. 11 and various other legislative proposals attempt to address this issue regionally. But unless a national control is imposed, MTBE will flow unfettered into areas where MTBE is currently not being used. Saudi Arabia is not going to take its MTBE back. MTBE producers will find other markets. The first place MTBE will flow is Midwest oxygenate markets where MTBE is currently not used. It is logical to assume that MTBE will also flow into conventional gasoline octane markets. In addition to displacing ethanol from these critical markets, this will merely expand potential MTBE water contamination and jeopardize precious water supplies. Only a national control of MTBE will protect *everyone's* water supplies and not disrupt existing oxygen and octane markets for ethanol.

Address the cause of the problem - MTBE.
The use of MTBE in the nation's motor fuel should be reduced or eliminated as expeditiously as possible.

The domestic ethanol industry should not be advising the Congress on how to control the use of its competition in the marketplace. However, we can state with conviction that if the problems associated with the use of MTBE are so serious as to warrant legislative action, Congress ought to be sure to fix them. The problem is not oxygen in gasoline, it is MTBE in water. Congress should determine what controls on MTBE are necessary to protect water supplies and take them. But simply eliminating the RFG oxygen requirement will NOT assure that MTBE use is reduced and WILL undermine the "real world" environmental benefits of the current RFG program with oxygen.

EPA's Blue Ribbon Panel concluded that MTBE use should be "reduced or eliminated." EPA staff recently went further, stating that MTBE should be removed from gasoline as quickly as possible. The Department of Energy has stated a 3% volume cap on MTBE is appropriate. Because MTBE is bio-accumulative and persistent in the environment, many believe the only sure means of protecting drinking water supplies is to prevent MTBE from getting into gasoline in the first place. In any case, Congress needs to take whatever action it deems appropriate to protect public health and water resources.

We would only suggest that as Congress debates this issue, and if an MTBE phase-out or other control is imposed, that consumers be made aware whether MTBE is being used in the gasoline they purchase. Pump labeling of MTBE is something that can be done quickly and effectively. We would strongly encourage EPA to act expeditiously so that consumers are aware when MTBE is being used. Consumers have a right to know.

Protect the Environment.
The air quality gains provided by RFG with oxygenates should not be sacrificed as MTBE use is reduced, i.e., the toxic and carbon monoxide emissions benefits of oxygen should be preserved.

The RFG program assures air quality benefits through the combined application of emissions performance standards *and* an oxygen requirement. As a result, the RFG program has provided toxic reductions in excess of those required by the performance standards alone. The oxygen standard has also provided reductions in carbon monoxide for which there is no performance standard at all. Congress should not reward the disastrous decision of the oil industry to utilize MTBE as the oxygenate of choice in RFG by allowing them to increase pollution.

Industry analysts have concluded that given the opportunity to produce non-oxygenated RFG, refiners will dramatically increase their use of aromatics and other petroleum-derived octane such as alkylate. The environmental consequences of alkylates is not known. The environmental impacts of aromatics certainly is known, and it is troubling. Increased aromatics will lead to higher toxic emissions and increased ozone pollution.

It is ironic that the RFG program was initiated largely in response to environmental concerns about the rising levels of aromatics in gasoline. Increased aromatics, including benzene, toluene and xylene (BTEX), resulted from the congressionally-mandated lead phase-down of the late 70's. To replace the lost octane associated with lead, refiners dramatically increased aromatic levels. By the mid-80's, some premium gasolines had BTEX levels as high as 50 percent. Seeing this, Congress created the RFG program in the Clean Air Act Amendments of 1990, including a specific cap on aromatic levels. That cap was forfeited by EPA in the regulations implementing the RFG program in favor of a complex model, with the understanding that the use of oxygenates in RFG would supply the octane and volume provided by aromatics. Congress should assure that as MTBE use is reduced, the cap on aromatics originally included as an RFG specification is re-established.

In addition, EPA should conduct a rigorous analysis of the "real world" emissions benefits of oxygen, including the impact on higher emitting vehicles, off-road and off-cycle driving (areas where the impact of oxygen is more critical) to assure there is no backsliding from these effects. EPA should also compare the potency-weighted toxic affects of oxygenated and non-oxygenated RFG.

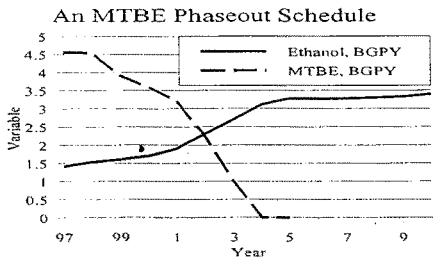
Finally, it is critical that the carbon monoxide (CO) benefits of oxygenates not be ignored. The oxyfuel program worked and CO has been dramatically reduced nationwide. Several CO non-attainment areas have been reclassified into attainment based in part on maintenance plans which include the oxygen content benefits of RFG. If the RFG oxygen requirement is repealed, the CO attainment status of these areas will be jeopardized. In addition, the National Academy of Sciences concluded last year that as much as 20% of the ozone coming from automobiles was attributable to carbon monoxide. EPA should assess this beneficial impact and either 1) incorporate a CO performance standard into the program or 2) promulgate a CO offset so that refiners can balance CO reductions with VOC increases.

Provide Flexibility to Refiners.
The expeditious removal of MTBE should not result in dramatically increased gasoline prices or supply shortages. Refiners and gasoline marketers should be given some flexibility in meeting this challenge.

Refiners claim the only way to eliminate MTBE without increasing consumer gasoline costs is to eliminate the oxygen standard itself. Indeed, some see the two as synonymous. At a time when gasoline prices across the country are soaring, Congress must consider the economic implications of reducing MTBE use. MTBE currently represents about 3% of the nation's transportation fuel supply. If it is precipitously eliminated without providing for a replacement of that supply, gasoline prices will clearly rise. Indeed, this fact has been established by both the Department of Energy and the California Energy Commission, which concluded a non-oxygenated fuel scenario in California (with no ethanol used) was the most expensive option available to the state in addressing MTBE. It is therefore critical that if MTBE volume is to be reduced, it is replaced with safe alternatives such as ethanol. Following the oil companies' "flexibility" agenda of no oxygen requirement and an all-hydrocarbon fuel supply will increase consumer gasoline costs.

But we believe there are ways to provide increased flexibility in meeting the oxygenate standard such that replacing MTBE with ethanol will not result in price spikes or supply shortages. Certainly, a gradual phase-out is the best way to protect against potential consumer impacts.

The U.S. Department of Agriculture has completed a comprehensive analysis demonstrating that ethanol can effectively replace MTBE by 2004 without price spikes or supply shortages. The Department's analysis shows that total ethanol production capacity will have to increase roughly 50%, to approximately 3 billion gallons by 2004, in order to supply the oxygenate demands of RFG while maintaining the existing ethanol octane markets in conventional gasoline.
USDA also analyzed the transportation affects of increased ethanol RFG.
The Department concluded that ethanol would be shipped by barge or rail cost-competitively, and that there would be "no transportation impediment to the use of ethanol as a replacement for MTBE."



Source: U.S. Department of Agriculture

The Ethanol Solution

The primary concern with maintaining the oxygen standard appears to be the industry's ability to supply the increased demand for ethanol. But such concerns are unfounded. It is important to understand that because ethanol has twice the oxygen content of MTBE, it will only take half as much ethanol to satisfy the oxygen requirements of RFG. Current MTBE use in RFG is approximately 257 bb/d (thousand barrels per day). That level of oxygen can be met by only 128 bb/d of ethanol. Current ethanol production is 100 bb/d.

A recent report prepared by AUS Consultants, Inc. for the Governors' Ethanol Coalition demonstrates that the ethanol industry can double production within two years, quicker than the proposed three year MTBE phase out. According to the report, "*Ability of the U.S. Ethanol Industry to Replace MTBE*":

- Replacing MTBE with ethanol would increase the demand for ethanol to nearly 3.2 billion gallons per year by 2004;
- The ethanol industry can increase production capacity from 1.5 billion gallons to 3.5 billion gallons per year by 2004 - more than exceeding the greater demand;
- The increased capacity would come from increased utilization of existing plants, expansion of existing facilities, new plants currently under construction, and proposed facilities currently in various stages of development;
- Using ethanol to replace MTBE will prevent an oxygenate supply shortage that could result in increased gasoline prices;
- Expanding ethanol capacity will result in $1.9 billion in new investment;
- Construction activity and increased commodity demand will add $11.7 billion to real GDP by 2004 and increase household income by $2.5 billion; and
- Switching to ethanol will create more than 47,800 new jobs throughout the country.

Ability of the Ethanol Industry to Replace MTBE
(Million Gallons per Year)

	2000	2001	2002	2003	2004
Ethanol Demand	**1,343**	**1,781**	**2,231**	**2,693**	**3,168**
Current Production	1,533	1,533	1,533	1,533	1,533
Increased Use	0	180	180	180	180
Expanded Plants	0	420	839	1,049	1,049
Cap'y Under Construction	0	60	121	121	121
Cap'y Under Development	0	0	0	333	598
Total Supply	**1,533**	**2,193**	**2,673**	**3,216**	**3,481**
Surplus	**190**	**412**	**444**	**523**	**313**

It is important to understand that ethanol production facilities are largely modular. Expansions can be done very quickly by simply adding new equipment to existing production streams. New production from green fields is also now done quite efficiently. Since 1990, most new ethanol production has been

by farmer-owned cooperatives. These highly efficient dry mill plants typically go from drawing board to production within two years, at an approximate cost of $1.00 - $1.50 per gallon of capacity.

The next generation of ethanol production facilities will also include production from cellulose and biomass feedstocks. Recently, a new ethanol production plant in Jennings, Louisiana was awarded a $120 billion bond and is expected to begin construction this spring. When completed, this plant will produce ethanol from rice hulls and bagasse. Three other plants are currently planned in California that will produce ethanol from rice straw. Another facility is planned in upstate New York producing ethanol from municipal waste. Already, ethanol is being produced from wood and paper waste by Georgia Pacific in Washington state, and production from forest residue is not far behind. None of this will happen, however, without the assurance of increased market opportunities for ethanol in RFG. If the oxygenate requirement itself is repealed, there will be little increased ethanol production in the coming years. On the other hand, maintaining the oxygen requirement as MTBE use is phased out will stimulate tremendous new economic development across the country.

Ethanol Production Capacity
March 2000

Company	City	State	Primary Feedstock	Capacity (MGY)
A.E. Staley	Louden	TN	Corn	45.0
Ag Power, Inc	Commerce City	CA		2.0
AGP	Hastings	NE	Corn	45.0
Agri-Energy	Luverne	MN	Corn	18.0
Al-Corn	Claremont	MN	Corn	18.0
Alchem	Grafton	ND	Wheat	12.0
Archer Daniels Midland	Decatur	IL	Corn	750.0
	Cedar Rapids	IA	Corn	
	Peoria	IL	Corn	
	Clinton	IA	Corn	
Broin Assoc	Scotland	SD	Corn	8.0
Cargill	EddyVille	IA	Corn	70.0
	Blair	NE	Corn	35.0
Cent MN Ethanol Coop	Little Falls	MN	Corn	18.0
Chief Ethanol	Hastings	NE	Corn	62.0
Chippawa Valley	Benson	MN	Corn	20.0
Corn Plus	Winnebago	MN	Corn	17.5
DENCO	Morris	MN	Corn	15.0
Eco Products of Plover	Plover	WI		4.0
ESE Alcohol	Leoti	KS	Corn	1.1
Ethanol 2000	Bingham Lake	MN	Corn	15.0
Exol	Albert Lea	MN	Corn	18.0
Farm Tech USA	Spring Green	WI	Corn	0.5
Georgia Pacific	Bellingham	WA	Waste	3.5
Golden Cheese of CA	Corona	CA	Cheese/Whey	2.8
Grain Processing Corp	Muscatine	IA	Corn	10.0
Heartland Corn Prods	Winthrop	MN	Corn	17.0
Heartland Grain Fuels	Aberdeen	SD	Corn	8.0
	Huron	SD	Other	12.0

Company	City	State	Primary Feedstock	Production Capacity (MGY)
High Plains	Portales	NM	Corn	14.0
	Colwich	KS	Corn	20.0
	York	NE	Corn	40.0
J.R. Simplot	Heyburn	ID	Potato Waste	3.0
	Caldwell	ID	Potato Waste	4.0
Jonton Alcohol	Edinburg	TX		1.2
Kraft	Melrose	MN	Cheese/Whey	3.0
Manildra Energy	Hamburg	IA	Corn	7.0
Midwest Grain	Atchinson	KS	Corn	8.0
	Pekin	IL	Corn	100.0
Minnesota Clean Fuels	Dundas	MN		1.5
MMI/ETOH	Golden	CO		1.5
MN Corn Processors	Marshall	MN	Corn	32.0
	Columbus	NE	Corn	90.0
MN Energy	Buffalo Lake	MN	Corn	12.0
New Energy Co of IN	South Bend	IN	Corn	88.0
Pabst Brewing	Olympia	WA	Bev Waste	0.7
Parallel Products	Rancho Cucamonga	CA	Food Waste	2.0
	Louisville	KY	Corn	10.0
Permeate Prods	Hopkinton	IA		1.5
Pro-Corn	Preston	MN	Corn	19.0
Reeve Agri-Energy	Garden City	KS	Corn	10.5
Stroh's Brewery	Winston Salem	NC	Bev Waste	1.0
Sunrise Energy	Blairstown	IA	Corn	5.0
Vienna Correctional	Vienna	IL	Corn	0.5
Williams Energy	Aurora	NE	Corn	30.0
	Pekin	IL	Corn	100.0
Wyoming Ethanol	Torrington	WY	Corn	5.0
Total				1,837.8

Source: Bryan and Bryan, Inc.

Ethanol Production Under Construction, March 2000

Company	City	State	Capacity MGY	Feedstock
Golden Triangle	Craig	MO	14.0	Corn
Adkins Energy	Lena	IL	30.0	Corn
BC International	Jennings	LA	20.0	Bagasse/rice hulls
Nebraska Nutrients	Sutherland	NE	15.0	Corn
Dakota Ethanol	Wentworth	SD	40.0	Corn
NE Missouri Grain Proc	Macon	MO	15.0	Corn
Total			**134.0**	

Source: Bryan and Bryan, Inc.

Ethanol Plants Under Development, March 2000

City	State	Capacity (MGY)	Feedstock
Undisclosed	CO	20.0	Corn
Central Iowa	IA	15.0	Corn
NW Iowa	IA	40.0	Corn
L. Cascade	IL	100.0	Corn
Pratte	KS	15.0	Corn/milo
Undisclosed	KS	40.0	Corn
Undisclosed	KY	20.0	Corn
Central State	MI	40.0	Corn
St. Paul	MN	30.0	Corn
SE Missouri	MO	30.0	Corn
Great Falls	MT	75.0	Wheat/Barley
Neely	NE	15.0	Corn
Central State	NJ	10.0	Corn
Clatskanie, OR	OR	80.0	Corn/wheat
Milbank	SD	40.0	Corn
Platte	SD	15.0	Corn
Rosholt	SD	15.0	Corn
Undisclosed	TX	30.0	Corn
Moses Lake	WA	40.0	Corn/Barley
Lacrosse	WI	20.0	Corn
Subtotal		**690.0**	
Biomass Conversion			
SE Region	AK	8.0	Wood Waste
NE Region	CA	15.0	Forest Residues
Gridley	CA	20.0	Rice Straw
Mission Viejo	CA	8.0	Rice straw
Chester	CA	20.0	Forest Residues
Onslow County	NC	60.0	Sweet potatoes
Greene County	NC	60.0	Sweet potatoes
Martin County	NC	60.0	Sweet potatoes
Middletown	NY	10.0	MSW
Central Region	OR	30.0	Wood Waste
Philadelphia	PA	15.0	MSW
Black Hills	WY	12.0	Forest Residues
Subtotal		**318.0**	
TOTAL NEW CAPACITY		**1,008.0**	

Ethanol RFG will provide a tremendous economic stimulus to rural America by creating value-added demand for 500 million bushels of grain. According to USDA, replacing MTBE with ethanol in RFG nationwide would:

- increase net farm income $1 billion annually;
- create 13,000 new jobs;

- enhance our balance of trade $12 billion by 2010; and,
- reduce farm program costs more than $1 billion for each $0.10 increase in corn price.

Thus, replacing MTBE with domestically-produced renewable ethanol will provide a tremendous economic stimulus to rural America while protecting air quality, preserving water resources and maintaining stable consumer gasoline prices and supply.

Conclusion:

The domestic ethanol industry understands that the Congress is faced with a daunting challenge, i.e, how to protect water supplies by reducing the use of MTBE without sacrificing air quality or increasing fuel prices. We see ethanol as a solution. Increasing ethanol use in this program will allow MTBE to be phased out cost-effectively while protecting precious water resources and air quality. Stimulating rural economies by increasing the demand for grain used in ethanol production will help farmers left behind by our booming economy. Encouraging new ethanol production from biomass feedstocks will provide additional environmental benefits and take a positive step toward a sustainable energy future and global climate change. The bottom line is that we need to protect both air quality and water quality. With ethanol, we can.

Thank you.

TO: UNITED STATES SENATE COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY
SENATOR RICHARD LUGAR, CHAIRMAN

FROM: ARKENOL
RUS MILLER, CHIEF OPERATING OFFICER

TESTIMONY: THE AFFECTS ON THE DEMAND FOR RENEWABLE FUELS CAUSED BY REDUCTIONS IN MTBE IN REFORMULATED GASOLINE UNDER VARIOUS SCENARIOS, TUESDAY, APRIL 11, 2000.

MTBE has been found in groundwater throughout the United States. It was identified early in California where it has been banned and is now being phased out of usage. MTBE was the refiner's choice to meet the original specifications as the preferred oxygenate in California in order to meet EPA requirements for Clean Air Act regulations and meet the federal minimum oxygen requirement in Reformulated Gasoline. The alternate renewable fuel ethanol has always been available, but was a non-petroleum source and its use was resisted by petroleum producers.

The removal of MTBE from the fuel supply of United States offers policy makers two choices. The first choice is to remove the oxygenated fuels requirements. Arkenol believes that the evidence in the EPA Clean Cities and Reformulated Gasoline programs of reduction in air pollution after requiring oxygenated fuels over the objections of petroleum producers speaks for itself. Since oxygenated fuels provide cleaner air the second choice becomes then, which oxygenates should be used? There are technical and societal factors to be evaluated in each case. Arkenol, obviously being a technology provider for ethanol production, concurs with the determination that ethanol is the best currently available route. While the Arkenol technology may be applied to produce numerous other oxygen bearing fuels, those fuels have not yet been proven in the marketplace, so ethanol is the choice.

The question before the Committee today is what would be the demand for renewable fuels under various scenarios. The California Energy Commission published a report 'Evaluation of Biomass-to-Ethanol Fuel Potential in California' in December of 1999. This report includes within it several studies of this question with ethanol as the fuel. The Executive Summary of that report is attached to my written remarks and a full copy of the report has been given to your staff.

I would like to address the key scenarios briefly and then answer your questions.

SCENARIO 1 - OXYGENATE REQUIREMENTS ARE UNCHANGED

To attain the required levels of oxygenation to effect the air pollution reductions currently achieved, MTBE must be used in about an 11% concentration in gasoline. As ethanol has a higher oxygen concentration, a

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blend would only require 6% ethanol to attain the same level of oxygenation. Ethanol has been typically blended at higher levels of 10% to comply with the tax code.

The complete replacement of MTBE with ethanol would generate a demand of over 1 billion gallons per year solely within California.

Scenario 2 - Oxygenate Waiver is granted except for EPA Seasonal requirements in Carbon Monoxide non-attainment Air Basins.

Under this scenario the Los Angeles and Sacramento air basins would be required to use an oxygenated fuel in the winter when carbon monoxide levels seriously exceed EPA Clean Air limits. The demand for ethanol to replace MTBE would be approximately 150 million gallons per year.

Scenario 3 - Oxygenates are no longer required.

With no oxygenate requirements in California there would likely be no renewable fuel used in the state. The petroleum producers are very unwilling to give up market share of their production volumes of basic gasoline. This is clearly expressed by the price of ethanol being $0.66 per gallon when unleaded gasoline is $0.85 today and ethanol has a higher octane rating.

Scenario 4 - A Renewable fuels standard is enacted

A renewable fuels standard is a sensible approach, but its implementation must be carefully considered to truly effect an expansion in renewable fuels use. It combines: (a) awareness of the environmental benefits of renewable fuel on immediate air pollution through oxygenation of fuel with (b) awareness of the environmental benefits of reduced carbon dioxide emissions with (c) awareness of the societal benefits of reduced oil importation from abroad. California uses about 14 billion gallons of gasoline per year. The United States as a whole uses about ten times that.

The USA imports 50% of the oil needed to make that gasoline at great cost to foreign exchange rates and in being militarily prepared to defend those foreign sources. The requirement for a Renewable Fuels Portfolio would ensure a clear requirement of biologically derived fuel with arithmetical precision. A 1% standard would continue a nation wide demand of 1.4 billion gallons, which is roughly the current production capacity of ethanol in the USA. An additional 1% added to that standard would then double the volume needed and displace 2% of the imported oil currently used. California has identified waste biomass volumes which could replace 30% of the total gasoline used within the state. Other states have similar resources.

As an aside here, these discussions only address gasoline blends. A nearly equal volume of diesel fuel is used in the USA. Ethanol is readily cosolvent blended into diesel nearly eliminating the particulate emissions typical of a diesel bus. Arkenol has made other biological oxygenates which blend with diesel without cosolvents. Arkenol has used third party tests to demonstrate that they achieve the same virtual elimination of particulate emissions.

SUMMATION

You have heard from many people today who are more qualified than I about various aspects of this decision making process in which you are engaged and you will hear from many more. I want to leave you with the understanding that there is a current industry which can support the use of renewable fuels. And more importantly from my company's perspective, there is an industry of biomass-to-ethanol technologies ready to meet nearly any demand for renewable fuels which can be imagined. These technologies can use the biomass cellulose from agricultural wastes, Conservation Resource Plan lands, urban green wastes, or even municipal solid wastes. These new technology companies need a reliable market for our products in order to attract the leading institutions to finance building the plants required.

We urge you not to succumb to this nation's petroleum addiction or the same scare tactics used to resist removal of lead from gasoline and implementation of reduced sulfur in gasoline. Do not take a step backwards by ignoring the demonstrated air benefits of renewable oxygenated fuels. Use the opportunity created by the current MTBE and oil price crisis to set an example for the world and put our nation on a path towards a sustainable future. We look forward to your decision supporting the renewable fuels community.

I thank you for the opportunity to appear before you and would like to answer any questions that you might have.

Respectfully Yours

Rus Miller

Arkenol, Inc.

Testimony of Jason S. Grumet

Executive Director
of the
Northeast States for Coordinated Air Use Management
(NESCAUM)

Before the

Senate Committee on Agriculture, Nutrition and Forestry

Hearing on
Reformulated Gasoline, MTBE and Renewable Fuels

April 11, 2000

Washington, DC

Thank you Mr. Chairman. My name is Jason Grumet and I am the Executive Director of the Northeast States for Coordinated Air Use Management (NESCAUM). NESCAUM is an association of state air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. The Association provides technical assistance and policy guidance to our member states on regional air pollution issues of concern to the Northeast. We appreciate this opportunity to address the Agriculture Committee regarding reformulated gasoline, MTBE, and ethanol. You may be aware that the northeast states have joined with national environmental groups, the American Petroleum Institute, and several refiners to promote a solution to the problems caused by MTBE. I wish to make clear from the outset, that while I will be discussing the substance of our collective principles, I am here today solely as a representative of the eight northeast states.

Our region has much at stake in the debate over RFG, MTBE and ethanol. Seven of our eight states have or are participating in the federal RFG program. The use of RFG in the Northeast has provided substantial reductions in smog forming emissions and has dramatically reduced emissions of benzene and other known human carcinogens found in vehicle exhaust.. However, the unique characteristics of MTBE pose unacceptable risks to our region's potable ground water. Groundwater testing conducted throughout the Northeast has detected low levels of MTBE in roughly fifteen percent of the drinking water tested. Nearly one percent of samples tested contained MTBE at or near state drinking water standards. MTBE's unpleasant taste and odor at higher concentrations and the frequency of MTBE detections poses a disproportionate and unacceptable threat to our region's drinking water.

Fortunately, the vast majority of MTBE concentrations detected in the Northeast are very low and the relative toxicity of MTBE is also low. These two factors lead public health experts in our region to conclude that the health threat posed by MTBE is relatively modest when compared against the present risk posed by other drinking water contaminants and is substantially overshadowed by their risk when compared against public health benefits of the RFG program as a whole. The challenge facing us all is to mitigate the environmental and economic harms caused by MTBE contamination without sacrificing the environmental and public health benefits provided by RFG. Adding to this challenge, is the need to provide continued confidence in a secure and growing market for ethanol and the opportunity to direct much needed support to a broad array of environmentally beneficial transportation fuels and advanced propulsion technologies. Of course, all this must be accomplished without exacerbating already skyrocketing gasoline prices.

Unfortunately, the law as currently written prevents both EPA and the states from effectively facing this challenge. The good news is that a diverse group of interests have come together to promote a set of legislative principles that will protect our air and water quality, ensure substantial growth in ethanol usage and provide refiners with the flexibility needed to prevent gasoline price spikes or supply shortages. I would like to submit to the record copies of the legislative framework the northeast states introduced in January of this year and subsequent statements endorsing this framework submitted by the American Lung Association, the Natural Resources Defense Council and the American Petroleum Institute. Since that time, the unprecedented coalition of interests supporting these legislative principles has grown to include several neighboring Mid-Atlantic states and independent refiners Sun company and TOSCO.

Allow me now to review the legislative approach supported by our unique alliance. I will then directly address how this approach and other scenarios will affect the demand for renewable and environmentally beneficial transportation fuels.

Review of Legislative Framework

I. Repeal or waive the 2 percent oxygen mandate for RFG in the Clean Air Act

It is simply not possible to protect air quality, water quality and ensure gasoline price stability unless the oxygen mandate is lifted or, at a minimum, modified to require EPA to waive this requirement upon state request. Unless the oxygen requirement is lifted or waived, a substantial reduction in MTBE use creates a de facto summertime ethanol mandate. While ethanol usage is far preferable to MTBE from a groundwater perspective and promotion of ethanol can further a host of energy, agricultural, and environmental goals, an ethanol mandate in the summertime reformulated gasoline program is not sound environmental or economic policy for the Northeast. Due to its high volatility and resulting increase in evaporative emissions, the use of ethanol during the summertime ozone season may actually exacerbate our urban and regional smog problems, absent further protections.

The growing outcry over skyrocketing gasoline prices demands that any legislative solution to the MTBE problem be mindful of fuel price and supply concerns. The economic impact of mandating the use of ethanol in the Northeast, California and the Gulf Coast is simply unknown. Setting aside the wisdom of coupling mandates with subsidies, serious questions remain about the cost and environmental impacts of transporting and distributing billions of gallons of ethanol throughout regions of the country where it is not produced. There is no question that it is possible to dramatically increase ethanol production. Similarly there is no question that it is possible to ship massive quantities of ethanol to the northeast by barge, rail and truck. The question is at what cost. While our region embraces the goal of increasing renewable fuels nationally and sees great promise in the development of a biomass ethanol industry in the Northeast, we are convinced that there are policy approaches to achieve these legitimate ends that are far preferable to mandating the use of ethanol in summertime RFG.

We are surprised and disappointed by legislative efforts to maintain the oxygen mandate and ban MTBE. These efforts seek short term economic enrichment for one region of the country at the economic and environmental expense of all others. Simply stated, this approach holds no promise to build the national consensus necessary to craft effective legislation. We hope that this Committee will reject short sighted efforts to perpetuate the oxygen mandate and instead work toward building a national ethanol market that emphasizes product quality over market protection.

II. Severely curtail or eliminate MTBE use as a fuel additive

We propose a three step approach to reduce, and if necessary, eliminate MTBE from the fuel supply. This approach requires a reduction in MTBE use to historic levels and empowers both EPA and the states to further regulate MTBE while minimizing the potential for a patchwork of varying state requirements that could result in increased fuel prices.

a) Compel EPA to regulate or eliminate MTBE use as a fuel additive if necessary to protect public health, welfare or the environment from air or water pollution.

With the notable exception of California, neither EPA nor the states have clear authority under federal law to prevent MTBE from harming drinking water supplies or the environment. EPA's recent efforts to explore existing authority under the Toxic Substances Control Act (TSCA) as a "safety net" in the absence of Congressional action does little to allay our concern over the inadequacy of existing Agency authority. Even a cursory review of the TSCA provisions suggests that its application to the question at hand will be arduous, inelegant and tangled in years of litigation. The northeast states share EPA's frustration over the inadequacy of our mutual authority. Our inability to address public concern over MTBE contamination is eroding public confidence in the commitment and competence of all levels of government and exaggerates public anxiety over the risks posed by MTBE. While EPA's strained interpretation of TSCA is understandable against this public backdrop, only Congressional action that both authorizes and obligates EPA to reduce MTBE to whatever levels are necessary to protect public health, welfare or the natural environment will provide the public with the protection they demand and deserve. While our states and alliance partners do not believe that the available data supports a statutory ban of MTBE, we agree that EPA must be required to eliminate MTBE as a fuel additive if the Agency concludes through rulemaking that such action is necessary to protect public health, welfare or the environment.

b) Compel EPA to reduce MTBE usage in all gasoline to historic (Pre-1990) levels.

At minimum, within one year from enactment of legislation, EPA must be required to complete a rulemaking that limits MTBE usage in all gasoline to the levels in use prior to the Clean Air Act Amendments of 1990. Data on MTBE contamination prior to the adoption of the oxygen requirements in 1990, suggest that this severe curtailment of MTBE use coupled with the tremendous improvements in underground storage tanks that has occurred since 1990 will effectively mitigate the risks posed by MTBE contamination. However, I must stress that if EPA determines that even this severe curtailment of MTBE usage is not adequate to protect public health, welfare or the environment, the Agency is obligated to further reduce or eliminate MTBE in gasoline altogether.

c) Authorize states to regulate MTBE beyond EPA requirements.

If EPA fails to act in a timely manner or fails to effectively mitigate the harms posed by MTBE, states must be empowered to further regulate MTBE sold within their borders. In order to balance the need for measured state authority against the desire for maximum consistency in fuel specifications, we propose to adhere to the state petition process found in the current clean air

statute. As in current law, state ability to implement independent fuel requirements would remain predicated upon EPA granting a state petition demonstrating the need for such action. Unlike current law which limits the grounds for state petitions to a demonstration that the action is necessary to attain a National Ambient Air Quality Standard (NAAQS), state MTBE petitions would be required to demonstrate that further regulation of MTBE is necessary to protect public health, welfare or the environment.

III. **Enhance the RFG performance standards to reflect the stricter of real world RFG Phase 1 performance or the existing RFG Phase 2 requirements for VOC, NOx and toxic emissions.**

The RFG program has produced dramatic air quality gains. Most significant have been the reductions in airborne toxics which have substantially surpassed the performance standards of both Phase 1 RFG requirements and the more stringent Phase 2 requirements that take effect this year. We believe that a substantial portion of these benefits has been provided by the high volume of oxygenates currently mandated in RFG. As we seek to provide refiners with the flexibility to reduce the use of MTBE, it is necessary to ensure that this flexibility does not result in higher polluting gasoline. For toxic emissions, this approach will require EPA to substantially enhance the RFG toxic performance standard over that currently required in the Phase 2 program. To date, the Northeast and Gulf Coast have achieved far greater air toxic reductions than the Midwest under the RFG program. Hence, we believe that setting enhanced air toxic requirements on a regional basis is the most accurate and equitable approach to ensuring that there is no loss of toxic emission benefits once the oxygen mandate is lifted or waived. This approach ensures that the environmental gains achieved across the country will be protected while acknowledging the circumstances that have resulted in the disparate toxic reductions provided by the RFG program to date. This approach is also consistent with the RFG program's historic application of different regional VOC requirements in "northern" and "southern" grade RFG. It is important to reiterate that our proposed approach would only apply in those states that opt to waive the oxygen requirement. We fully expect that several states will opt to maintain the oxygen requirement as a further incentive for ethanol use. In these states, there is no risk of air quality "backsliding" resulting from a reduction in oxygenate use and hence these enhanced regional toxic standards would not apply.

a) Maintaining VOC and NOx Benefits

The Phase 2 standards that take effect this year are more protective than the actual VOC and NOx reductions achieved under the RFG program to date. Hence, the phase 2 standards would remain in force. By combining the actual toxic emissions performance of Phase 1 RFG with the more protective Phase 2 standards for VOC and NOx, we believe we can equitably and effectively maintain the full air quality benefits provided by the RFG program.

b) Maintaining Carbon Monoxide Benefits

While the CO reductions provided by oxygenates have and will continue to diminish as newer technology vehicles enter the national fleet, oxygenates continue to provide important benefits in

the few areas of the country that continue to exceed the CO NAAQS. We do not propose any changes to the statutory requirements for oxygenate use affecting CO nonattainment areas. Recent evidence indicates that CO reductions also play a relatively minor but measurable role in ozone reduction. The northeast states support a recognition of these modest and decreasing benefits so long as we count them only once. Since EPA is currently seeking to account for these benefits in a regulation that would provide ethanol blends with a further relaxation of RVP requirements, we do not believe that it is necessary or credible to take account of these same benefits a second time in legislation.

c) Particulate Emissions

Advocates of the oxygen mandate have suggested that a comprehensive anti-backsliding approach must also include provisions to maintain reductions in particulate matter attributable to oxygenate use. While NESCAUM is an ardent advocate of the need to reduce both direct PM emissions and PM emission precursors, we do not believe there is adequate scientific evidence to justify addition of a new PM reduction obligation at this time. We urge EPA and academia to conduct the research necessary to build a general scientific consensus around the impact of oxygenates on PM emissions. However, we cannot delay the critical effort to enhance the environmental performance requirements for toxic emissions while we await the result of future studies. The inadequacy of our understanding of the relationship between oxygenates and PM is evidenced by the fact that there is no currently requirement for PM reductions in the RFG program whatsoever. Unlike the cases of VOC, NOx and toxics, where there are existing performance requirements and intricate regulatory compliance regimes already in place, we believe it is premature to include PM reductions in the discussion of air quality backsliding.

IV. Promote consistency in fuel specifications through the timely implementation of effective federal requirements

The northeast states share the goal of providing refiners and fuel suppliers with a consistent and coordinated set of regulatory requirements. The most effective means of achieving this consistency is to authorize and require timely action on the part of EPA. Our states are committed to working with other regions and EPA to develop a federal regulation that meets our collective needs

V. Provide adequate lead time for the petroleum infrastructure to adjust in order to ensure adequate fuel supply and price stability

At present, the gasoline system in the Northeast and much of the nation is dependent upon the presence of high volumes of MTBE. As much as we need immediate action to address MTBE contamination and reinvigorate the RFG program, we recognize that a severe curtailment in MTBE use cannot be completed overnight. Depending on the ultimate extent of required reductions, our states anticipate that two to four years will be necessary to complete the phase down or elimination of MTBE in the Northeast. We are committed to working with our partners in the refining industry to ensure that fuel quality, supply and price are protected as we shift from our current dependence on MTBE.

Impact on Renewable Fuel Use

As stated earlier, implementation of legislation based on these principles will result in a substantial increase in ethanol use over the coming decade. The severe curtailment and/or elimination of MTBE as a fuel additive coupled with a maintenance of the mass toxic benefits achieved in Phase I RFG will force refiners to substantially increase their current use of ethanol. Key among the market factors leading to this increased demand is the need to replace the loss of octane in the fuel supply without increasing air toxic emissions. While experts vary on the exact magnitude of growth in ethanol demand, every analysis we have seen agrees that the competitive future for ethanol is very bright. The following graph illustrates our best assessment of the growth in ethanol if states are given the authority to lift the oxygen mandate and MTBE is phased down to pre 1990 levels. If MTBE is further reduced or eliminated, the growth of ethanol will be even greater. This projection reflects analysis conducted by NESCAUM, API and ALA using data generated by the USDOE, the USDA, and two leading consulting firms, MathPro and Downstream Alternatives. The more conservative estimate, assumes that the ethanol needed to satisfy PADD 1 and PADD 3 demand is met by pulling existing ethanol out of the Midwest markets, leaving national ethanol demand outside of California unchanged. It adds to this static 49-state assumption, the growth that would occur in the California market provided by MathPro's analysis conducted for the California Energy Commission.[1] The MathPro study indicates that 40 percent to 60 percent of California gasoline would be blended with ethanol at 2.7 weight percent resulting in nearly a billion gallons of new ethanol demand annually. The assumption that all ethanol demand outside of California will be satisfied by shifting ethanol out of Midwest markets is an unreasonably conservative projection of the impact of our legislative approach. First, it assumes no additional policies are adopted by Midwest states to promote or require ethanol use and second it assumes that Midwest states opt to waive the oxygen standard. The alternative scenario that projects ethanol use more than doubling over the next decade was derived by combing the same MathPro analysis for California with the DOE estimate for ethanol growth in the Northeast[2]. As you can clearly see, this analysis projects that ethanol use will fully double by 2004 growing from 1.5 to over 3 billion gallons per year.

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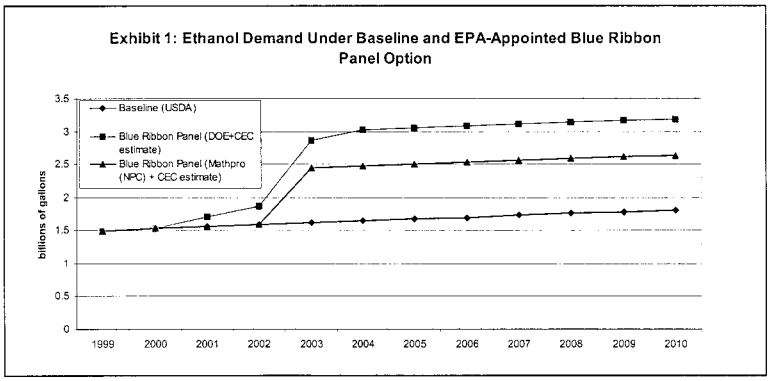
[1] *Analysis of California Phase 3 RFG Standards*, Submitted to the California Energy Commission by MathPro Inc., Subcontract No. LB60100, December 7, 1999.

[2] *Estimating Refining Impacts of Revised Oxygenate Requirements for Gasoline*, Oak ridge national Laboratory, Studies for the U.S. DOE Office of Policy May-August 1999.



In order to promote a truly secure future for ETOH, it is time to shift our collective emphasis away from efforts at further market protection and toward a rejuvenated focus on product quality. While mandates provide a level of absolute security that is never possible in a free market, this security comes at a considerable cost to the ethanol industry. Mandates undermine the public's confidence in the quality of ethanol as a motor fuel. As we have heard from a diverse number of government and private sector experts today, ethanol presents a host of compelling domestic economic and environmental benefits. The imposition of a sales quota, contradicts these expert sentiments by embracing the intuitive contradiction that ethanol is so good for the country that it cannot compete. I firmly believe that the renewable fuels market will never achieve its full market potential so long as that market is understood to depend on political power and not product quality. Moreover, markets that appear contingent upon politics will constantly face the insecurity of political change. Product quality will forever remain the only true security in a democratic nation with a free market economy.

As an advocate of a set of policies that are projected to more than double ethanol use within four years of enactment, I proudly embrace the label of ethanol advocate. At the same time, I recognize that ethanol like all products has present benefits and liabilities. Regardless of whether ethanol use flourishes under a free market or national quota, there are a host of economic and environmental considerations that must be accounted for as ethanol use expands.

Key Environmental Considerations from Expanded Ethanol Use

Air Quality

Without further statutory or regulatory protections, the widespread use of gasoline containing ethanol will increase evaporative emissions of VOCs due to it high volatility characteristics. The obvious first step to address this problem is to remove the 1 lb. RVP waiver for conventional gasoline containing ethanol. Increased evaporative emissions have a deleterious impact on ambient levels of ozone and increase emissions of toxic pollutants such as benzene. Also of concern is the so-called "co-mingling" effect. When ethanol blends mix with non-ethanol blends they increase the volatility of the entire volume of fuel. Consequently, even if the ethanol fuel

itself complies with RVP limits, its presence in a diverse fuels market will have consequences whenever a vehicle that has recently been fueled with an ethanol blend is re-fueled with an ethanol free gasoline.

The combustion of ethanol-blended gasoline results in a 50 to 70 percent increase in acetaldehyde emissions compared to MTBE blends. Ambient levels of this pollutant currently exceed health-based standards by a substantial amount in many areas in the Northeast. Increased ethanol use is also likely to cause some increase in NOx emissions in the Northeast. There are direct and indirect components to this anticipated NOx increase. Some engines have been shown to directly emit increased levels of NOx when burning fuel containing ethanol. In addition, the fact that ethanol blends cannot be shipped through gasoline pipelines will create indirect but potentially substantial increases in NOx and particulate emissions from the diesel trucks, locomotives and barges used to move hundreds of millions of gallons of this product from Midwest production facilities to markets in the Northeast.

Groundwater

There is broad agreement that the potential groundwater impacts of gasoline blended with ethanol are far less significant than those associated with MTBE blends. Nevertheless, the presence of ethanol in gasoline raises some concern with regard to groundwater contamination. In short, there is evidence to suggest that the microbes that biodegrade benzene, toluene and other volatile organic compounds are preferentially attracted to ethanol. The good news is that ethanol is quickly biodegraded when present in groundwater. The bad news is that the bacteria fails to degrade benzene and the other VOCs present in gasoline plumes until all the ethanol is consumed. Hence, BTEX compounds are predicted to persist longer in groundwater when gasoline mixtures containing ethanol are leaked or spilled. Evidence presented to the Blue Ribbon Panel suggest that this effect while not insubstantial pales in comparison to the groundwater threat posed by MTBE.

Key Economic Considerations from Expanded Ethanol Use

Transportation and Distribution

As stated above, gasoline blends with ethanol cannot be transported via existing pipelines due to ethanol's affinity for water. Consequently, unless dedicated ethanol pipeline capacity emerges, the widespread use of ethanol in the Northeast will require transporting hundreds of millions of gallons of ethanol by rail, truck or barge. New storage tank capacity and blending facilities will also be needed in our region to accommodate increased demand. While there are broad differences of opinion about the magnitude of this logistical challenge, it is imprudent to support a market mandate that would require the Northeast to use disproportionate amounts of ethanol compared to the rest of the nation until these logistical impediments and their associated economic and environmental impacts are better understood.

Gasoline Cost Impacts

Detailed studies by the U.S. Department of Energy and the California Energy Commission suggest that any major shift from MTBE to ethanol should be phased in over three to four years to avoid dramatic price spikes or fuel shortages.

The northeast states do not support a waiver of the Reid vapor pressure (RVP) requirements to accommodate the increased volatility of gasoline blended with ethanol. In order to meet the existing volatility requirements, the base conventional and reformulated gasoline into which ethanol is blended must be more severely refined in order to meet the same RVP standards. While opinions differ on the costs of this additional refining, they will not be insubstantial when incurred across the national fuel market

Ethanol Subsidies

The fact that ethanol receives a 54 cent per gallon subsidy -- in the form of a partial exemption from the federal fuel excise tax and an income tax credit -- has important implications for the Highway Trust Fund in the Northeast. Currently, this subsidy reduces the nation's Highway Trust Fund by approximately $870 million annually. A doubling or tripling of ethanol use in gasoline will have the effect of further reducing highway revenue by a substantial amount. While we are not seeking to address the validity of the ethanol subsidy if market conditions are allowed to determine future ethanol growth, an evaluation of ethanol tax policy is surely warranted if we impose a national ethanol sales mandate.

Renewable Fuels Standard

Many, though not all, of these concerns are substantially mitigated if ethanol is used at the right time in the right places. Not surprisingly, approaches that enable the market to determine how and where ethanol is used go a long way toward encouraging the most economical and environmentally beneficial uses of ethanol. To the contrary, the constraints of a de facto summertime ethanol mandate and RFG legislative efforts to reinforce this outcome provide the worst possible environmental and economic scenario for a growing ethanol industry. Under this nonsensical approach, the national interest in promoting renewable fuels is imposed on regions of the country farthest away for the source of ethanol production at the one time of the year when ethanol's volatility leads to considerable public health concerns.

Compared against this looming disaster in national policy, our region has previously expressed considerable interest in the concept of a Renewable Fuels Standard (RFS) approach. While we maintain a principled apprehension about the imposition of an overarching sales quota for the reasons stated above, the RFS takes a strong step toward free market principles by enabling economic and environmental considerations to influence when and where ethanol is sold. Moreover, an RFS legitimately emphasizes the national security, agricultural, and global environmental benefits that are furthered by an increased use in ethanol. The logic of these interests provides a far more compelling rationale than the pretense that ethanol is necessary to protect urban air quality. Efforts to perpetuate the oxygen mandate must justify this position on the basis of ethanol's ability to improve summertime urban air quality which is one of the weakest rationales for growth in ethanol use. I am pleased to finally be discussing the topic of renewable fuels in the context of agriculture policy where the benefits of ethanol use are best reflected.

In July of last year, Senator Daschle was kind enough to write to NESCAUM and the Governor's of our region seeking to explain his support for replacing the oxygen mandate with a 2.1percent RFS and seeking northeast state input. I would like to submit to the record copies of my response as well as the responses from Governor Shaheen from New Hampshire and Governor

King from Maine. While all three responses expressed apprehension regarding many of the issues outlined above, each letter expressed the belief that the flexibility provided by a properly designed RFS would better respond to our stated concerns about ethanol than Congressional inaction. Key to the proper design of an RFS, is the ability of refiners to avail themselves of market based approaches to meet their ethanol sales quota. By enabling refiners to average internally and with other fuel suppliers to meet their annual renewable content minimums, we believe that ethanol will be used where it is cost-effective to do so. We simply don't know whether it will be cost effective to transport and distribute ethanol produced in the Midwest throughout the northeast market. Unlike the oxygen mandate that would force refiners to sell a disproportionate amount of ethanol volume in the Northeast regardless of economic considerations, a properly designed RFS enables refiners to sell ethanol where it makes economic sense.

From both an environmental and economic standpoint, a properly designed RFS must also enable refiners to use ethanol when it makes sense to do so. The version of the RFS that was provided for our review last year allowed refiners to comply with the RFS on an annual average basis. This flexibility is critical to ensure that ethanol is only used sparingly in cities that suffer from summertime ozone nonattainment. I am concerned that the more recent incarnations of the RFS seek to impose a quarterly averaging regime. Requiring that one-quarter of our national ethanol use occur during the summer months is unsound environmentally and will lead to increased fuel prices since refiners will be required to reduce the overall volatility of their blendstock to accommodate ethanol within allowable RVP limits. While I recognize that small ethanol producers do not presently maintain the tank capacity to store ethanol produced during the summer season, expanding this tank capacity seems far preferable than forcing the sale of ethanol in the summer months.

Of course the most important feature of a properly designed RFS is the magnitude of sales requirement itself. When Governor Shaheen stated that, "a renewables fuel requirement-- accompanied by elimination of the federal oxygenate mandate-- holds great promise and represents a wise precedent for the nation to establish,[3] she was evaluating a 2.1percent RFS that was understood to represent a doubling of ethanol production over the next ten years. We now understand Senator Daschle's approach to contemplate more than tripling ethanol use in this same time period. This contemplated increase from a statutory doubling to a tripling of ethanol under an RFS will greatly increase opposition to the RFS in our region.

At the same time, we wish to applaud Senator Daschle's recognition of the additive environmental and potential economic attributes of biomass ethanol in fashioning a differential credit for biomass in the current RFS proposal. While it is awkward to offer suggestions on how to design a sales quota that on balance we deem unnecessary, one thing that I have learned from this debate is that those who can't imagine creative compromises are quickly left behind. While the 1.2 -1 credit ratio for biomass is a move in the right direction, we believe that it does not go far enough to recognize the tremendous environmental potential and legitimate economic barriers that must be overcome for this burgeoning industry to take hold.

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[3] Letter for Governor Jeanne Shaheen to Senator Tom Daschle , September 16, 1999

If we are going to impose an RFS, this standard should be optimized to encourage entrepreneurial innovation and growth among small businesses and farmers and seek to remedy market barriers and the failure of financial markets to effectively internalize the full social costs and benefits of different actions. Toward this end, I encourage RFS advocates to consider provision of initial credit for all small producers of ethanol regardless of the base feedstock and then an additional credit for ethanol made from biomass. Under this approach, small volume biomass producers could begin to receive the support necessary to overcome the considerable barriers to the creation of this new industry. Moreover the tremendous benefits biomass ethanol provides for climate protection, waste reduction and land use policy that are presently undervalued by existing markets would begin to get just recognition. In addition, small farmers who often exist on the very margins of economic survival would also receive additional benefit under this approach.

Obviously, the opportunity to cure "market failures: through quotas and mandates can be quite seductive. Hence, before I abandon this creative flourish, I also suggest that RFS supporters consider broadening the universe of fuels that could count towards RFS compliance to include the full suite of fuels identified in the Energy Policy Act (EPACT). The northeast states have long advocated for policies that reward advanced transportation technologies like electric and hybrid electric vehicles, compressed natural gas in urban bus fleets and ultimately fuel cell technologies. These technologies promote many of the same national security and fuel diversification goals that we understand form the substantive foundation of the RFS. Moreover, due to superior efficiency, those technologies that rely on electric drive trains achieve far greater reductions in air pollution emissions than internal combustion engines regardless of the volume percentage of renewable fuels. While a diversified RFS is potentially complex to administer, the country has failed woefully to achieve the laudable EPACT goal of diminishing our reliance on petroleum transportation fuels by 10 percent by 2000. If we are prepared to use this opportunity to work toward achieving the noble goal of decreasing the United State's reliance on foreign petroleum, it seems worth contemplating a broad and flexible approach that will inspire the country's ingenuity and creativity.

Conclusion

In conclusion, let me stress that the preferred approach of the northeast states is to lift the oxygen mandate, severely curtail and if necessary eliminate MTBE, maintain VOC, NOx, and toxic emission benefits achieved, and allow ethanol to grow on the basis of its legitimate and considerable attributes. I am pleased to learn that many of the strongest traditional advocates of a growing ethanol industry recognize that it is possible to support ethanol while opposing ethanol mandates. I would like to submit a set of six editorials from newspapers in Nebraska and Iowa commenting on state efforts to mandate the use of ethanol over the last year. The headlines demonstrate that our interest in promoting ethanol on the basis of product quality is shared by many of our Midwest neighbors:

- From the *Des Moines Sunday Register*, September 19, 1999 - "Let ethanol prove itself: Iowa farmers need help, but coercion at the gas pump is wrong,"

- From the *Quad City Times*, September 19, 1999, "Ethanol-only proposal doesn't help consumers,

- From the *Omaha World Herald*, March 9, 2000 - "More Alcohol, Less Choice

Obviously, we are troubled that having failed to impose ethanol mandates in their own states, several prominent Midwest officials now seek Congressional action to impose ethanol mandates in ours. Still, I remain optimistic that by emphasizing market principles in the effort to promote the use of renewable and clean fuels we can fashion a workable solution to the legislative challenges that lie ahead. Thank you for the opportunity to appear before the Committee. I welcome the opportunity to respond to any questions you may have.

The MTBE Crisis and the Future of Renewable Fuels

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Before the U.S. Senate Agriculture, Nutrition and Forestry Committee

April 11, 2000

I thank the members of this Committee for giving me the opportunity to testify on this important issue. My name is David Morris. I am Vice President of the 26 year old Institute for Local Self-Reliance, a non profit policy research organization based in Washington, D.C. and Minneapolis.

ILSR's mission is to strengthen local economies. Fifteen years ago I coined the term, the "carbohydrate economy", to describe an industrial economy whose materials foundation consisted largely of plant matter, and whose processing and manufacturing enterprises were significantly owned by the cultivators of that plant matter. The carbohydrate economy maximizes environmental benefits while also maximizing economic benefits to the communities that cultivate and process the raw materials.

ILSR's web site, www.carbohydreeconomy.org contains what we believe is the world's largest data base of companies involved in converting plant matter into fuels and industrial products. Over the years we have published dozens of technical and policy reports, including, *The Carbohydrate Economy: Making Chemicals and Industrial Materials from Plant Matter; Ethanol Policy and Development; A New Industry Emerges: Making Construction Products from Cellulosic Materials.* ILSR also publishes the quarterly magazine, *The Carbohydrate Economy.*

This hearing is about the future, but we cannot know where we want to go if we don't know where we have gone. Therefore, I'd like to take a couple of minutes to briefly review the history of gasoline additives.

By the end of World War I, ethanol production had reached 50 million gallons. When the car industry introduced higher compression engines, ethanol was very much in the running to become the anti-knock additive of choice. Ethanol was the superior candidate, but oil companies were uninterested in giving up 10 percent of the gas tank to farmers. Thus they chose lead, an additive that required only a few ounces per gallon. At the time leaded gasoline was introduced there was such a controversy about its potential public health effects that the federal government took the gasoline off the market for a year while the U.S. Surgeon General oversaw an analysis that astonishingly and shamefully gave leaded gasoline a clean bill of health. By the late 1930s 70 percent of all gasoline was leaded.

In the 1970s the federal government tried to reduce air pollution by requiring that new cars come equipped with catalytic converters. Then we discovered that lead in gasoline harmed the catalytic converters. Moreover, compelling evidence had been gathered to identify leaded gasoline as the cause of serious health problems. The federal government responded by phasing out leaded gasoline.

Ethanol was again available as an octane enhancer, but oil companies again preferred fossil fuels over living fuels. They raised octane levels by dramatically increasing the light aromatic fraction of their gasoline. By the late 1980s as much as 40 percent of gasoline consisted of chemicals like benzene, toluene and xylene.

The Clean Air Act of 1990 forced oil companies to reduce benzene levels. It also required them to add oxygen to gasoline in many parts of the country. Once again ethanol was the perfect solution. Once again oil companies opted for a fossil fuel derived additive: MTBE.

And now MTBE has shown up in ground water and lakes from California to Maine. The outrage has led California to phase out MTBE over the next three years and to a federal recommendation to phase out MTBE nationwide. That is why we are meeting today, to discuss alternatives.

As we do so we should learn from our mistakes. California is aggressively trying to persuade the federal government to abolish the oxygenate requirement altogether even though its own California Energy Commission has concluded that this would be the most costly and potentially the most disruptive option. Such a crude oil-only policy would make us dependent on the oil industry's once again reformulating its gasoline. The history of lead, aromatics and MTBE does not instill confidence that they can come up with a reformulation that doesn't create more problems than it solves.

The MTBE catastrophe is a classic result of partial cost accounting. Government agencies evaluated the additive from only one perspective: its impact on air quality. They ignored its impact on water quality. In seeking alternatives, the federal government would be well-served to adopt a full cost accounting approach.

It is time for a full cost accounting approach to transportation fuels. When we do so, ethanol is clearly the superior candidate.

Environmental Issues

The perfect transportation fuel has yet to be identified. Methanol is corrosive and toxic. MTBE, which represents two thirds of the oxygenate market, is, as we have seen, polluting the ground water. Electric vehicles presently rely on a half ton of lead acid batteries, a potential environmental problem and they increase the generation of electricity which, depending on the fuel used to generate the electricity, can cause environmental problems as well.

Ethanol has its shortcomings as well, but when we compare it to alternatives, it stacks up very well indeed. And as an aside, one of the most attractive of all transportation fuels, hydrogen, can be and I suspect will be extracted from plant matter in the long run.

Presently ethanol is made from sugar and starch from a variety of feedstocks(sugar cane, barley, wheat, corn, potatoes, whey, brewery wastes). Corn represents the raw material for over 90 percent of U.S. ethanol. Some environmentalists worry that we should not devote any land to feeding our cars when a growing world population goes hungry. But this is not a stark either-or choice. When ethanol is produced from corn starch the amount of feed protein produced per acre is not reduced. Indeed, the value of that protein is enhanced by concentrating it. Making ethanol does reduce the amount of starch but there is no apparent looming worldwide shortage of starch.

Moreover, most industry analysts believe that starch is only a transitional feedstock for making ethanol. Starch has a high value and if it is used for industrial purposes it may find more attractive markets as a biochemical rather than as a biofuel, as butanol and polylactic acid and other higher priced commodity and specialty chemicals.

Many believe that cellulose in the form of corn stalks, municipal solid waste, prairie grasses, etc. will become the raw material for future ethanol production. Cellulosic crops require relatively small amounts of inputs, have a very attractive overall environmental impact and can be grown in sufficient abundance to provide 10-20 billion gallons of ethanol a year. Several companies are seriously pursuing cellulose-to-ethanol production facilities.

Some in the environmental community worry about the net energy ratio of ethanol. Corn is the feedstock of choice for making ethanol and corn is a relatively energy intensive and fertilizer intensive crop. However, the

energy intensity of corn has dropped by over 35 percent since 1980.[1] And the energy intensive of ethanol manufacturing plants has dropped by 80 percent since 1980.

ILSR was the first to undertake an in-depth, case-study based investigation of the energy used to make ethanol. The initial report, *How Much Energy Does It Take to Make a Gallon of Ethanol?* was issued in 1993 and updated that report in 1995. When we looked at the operating efficiencies of the best ethanol plants and the best corn growing state, a good indicator of the energy efficiency to be expected from future ethanol production, the energy output to input ratio was more than 2 to 1.[2]

ILSR also compared the greenhouse gas impact of gasoline with MTBE, with that of gasoline with ethanol. Our draft report concluded that when MTBE is used in gasoline, greenhouse gas emissions could increase by up to 8 percent or decline by up to 4 percent. When ethanol is the additive greenhouse gas emissions reductions range from 10 to 40 percent.[3]

With regard to ground level air quality impact, ethanol contains by far the highest amount of oxygen of any alternative. A 10 percent blend can reduce carbon monoxide emissions by some 20 percent. Carbon monoxide is a harmful pollutant in its own right and one of the precursors of ozone formation,.

The only real controversy regarding ethanol and air quality appears to be around the question of ozone formation. There are some in the environmental community who think the addition of ethanol increases ozone formation, although when we examine even the most pessimistic of these studies we find that the projected increase is very small.

We should keep in mind, however, that ozone is not directly emitted but rather is formed by the interaction of a number of chemicals. Back in 1990 the Clean Air Act required that regulators assume a direct correlation between the quantity of hydrocarbons in the air and the amount of ozone formed. Today the government relies on a more complex analysis. That analysis takes into account not only the quantity of emissions but their reactivity. Ethanol, a less reactive chemical, replaces more reactive elements of gasoline. The reduction in reactivity offsets the increase in mass hydrocarbon emissions.

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[1] AREI/Production Inputs. Economic Research Service. USDA. Washington, D.C. 1996.

[2] Irshad Ahmed, David Lorenz, David Morris, *How Much Energy Does It Take to Make a Gallon of Ethanol?* ILSR. Minneapolis, MN. August 1995. A later study by the USDA echoed ILSR's findings. See Hosein Shapouri, James A. Duffield and Michael S. Graboski, *Energy Balance of Corn Ethanol Revisited*. USDA, Office of Energy. 1995.

[3] Irshad Ahmed and David Morris, *Ethanol, MTBE and Greenhouse Gas Emissions*. Draft. ILSR. Minneapolis, MN. June 1994.

And as noted above, ethanol produces the greatest reduction in carbon monoxide emissions, one of the elements of ozone formation.

The conclusion by a growing number of atmospheric scientists is that ethanol, at worst, generates no more ozone than does MTBE. At least one study of the Minneapolis area concluded that a 10 percent ethanol blend reduces ozone formation by about 10 percent.[4]

Any environmental evaluation of ethanol blends should consider the impact on air toxics. This is an issue that has only recently been receiving attention. Ethanol displaces up to 10 percent of the gasoline and the elements of the gasoline it displaces are carcinogenic substances like benzene, toluene and xylene. When toluene and xylene are burned they add to tailpipe benzene emissions. According to one analysis, a splash blend of 10 percent ethanol reduces benzene exhaust by 25 percent and reduces the overall toxicity of the gasoline, based on the California Air Resources Board potency weighting, by 30 percent.[5]

Finally, we should note that the evaporative emissions of ethanol itself are not a problem. Indeed, ethanol's evaporative emission rate is about half that required of gasoline under the Clean Air Act. Add a few ounces of ethanol to a gallon of gasoline and the gasoline's emissions of volatile organic compounds rises by about 15 percent or 1 pound increase in Reid Vapor Pressure(RVP). Add 10 percent ethanol and the volatility increase stays at 15 percent. But if ethanol rises to about 25 percent of the gasoline's content, the RVP goes back down to where it was before ethanol was added. And if ethanol becomes the primary fuel, something that is happening as E85 cars begin to take the road, the volatility drops dramatically below that of gasoline-only cars.

We should not visit the sins of gasoline on the head of ethanol.

Economic Issues

Ethanol is an attractive environmental fuel. More attractive still is its potential for economic development in both rural and urban communities.

An increased demand for ethanol increases the price of corn, albeit modestly. An increased number of ethanol plants increases the price of corn to nearby farmers significantly, largely because of avoided transportation costs. But the maximum benefit to American farmers occurs when the farmers themselves own the plant.

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[4] Gary Whitten, unpublished report to the Minnesota Pollution Control Agency. Systems Application International, Inc. San Rafael, CA. Data reported by Renewable Fuels Association. Washington, D.C.1996.

[5] Whitten, Op. Cit.

Many observers note the dominant role that ADM plays in ethanol production. It is true that ADM remains the largest ethanol producer by far, but the fastest growing sector of the ethanol industry consists of locally owned, small and medium scaled biorefineries. Indeed, ARCO's market share of the U.S. MTBE market in 1998 was only slightly less than ADM's share of the U.S. ethanol market.

Most American states produce no petroleum. Even Texas is a net oil importer. The U.S. imports a majority of our oil. The Energy Information Administration predicts that this could soar to 75 percent in the next 10-15 years.

Today there are about 20 cooperatively owned ethanol cooperatives nationwide. In my home state of Minnesota about 11 of the state's 15 ethanol plants are owned by more than 8,000 farmers. Ethanol constitutes 10 percent of all gasoline fuel sold in Minnesota, and farmer owned biorefineries produce over 90 percent of that total.

Ethanol has the additional benefit, pointed out by many, that it displaces imported oil. It also displaces increasingly imported MTBE. Today one third of MTBE is imported. In 1996, according to the Energy Information Administration, 1.4 billion gallons of MTBE were imported, up from 400 million gallons in 1993. More than 70 percent of MTBE comes from OPEC countries.

Finally, we should realize that ethanol is the entry point to an even greater materials revolution: the substitution of biochemicals for petrochemicals. The process for making ethanol can be and is evolving into processes for making higher value commodity and specialty chemicals like butanol and polylactic acid and levulinic acid and glycerine. The incentives offered to the ethanol industry have not only built a viable transportation fuels industry but has built the foundation for the revival of biochemicals. The country that gains the leadership in these technologies will find an eager market among billions of people who live in countries that have an abundance of plant matter but lack the hard currency to import expensive petrochemicals.

Comparing tax incentives

Let me turn finally to the question of tax incentives, a contentious point among many.

The revolution in our transportation fuel sector has brought many new and old fuels into the marketplace: electricity, propane, natural gas, ethanol, methanol.

The government provides incentives for all these cleaner burning fuels. Some incentives, like the one for ethanol, are given to the fuel itself. Others, like those offered electric vehicles or compressed natural gas vehicles, are given for the conversion of the vehicle or for the construction of fueling facilities.

I believe one could make a strong argument that among alternative fuels, ethanol receives one of the smallest tax incentives.

Electric vehicles receive a federal tax credit of 10 percent of the value of the car. In California, EV-1 manufactured by GM and the Solectra electric vehicle sell for about $32,000. Thus the value of the federal tax credit is $3200. Some states provide substantial additional tax benefits and some electric utilities offer EV owners lower electric rates.

The EV federal tax credit is much higher than the ethanol tax incentive. Ethanol's tax incentives come to about $30 per vehicle-year.[6] The EV federal tax credit comes to about $3200, which if invested in treasury bills would generate about $200 per year while maintaining the principal.

For natural gas conversions and fueling stations the federal government offers a tax deduction rather than a credit.[7] Several states offer additional conversion and fueling station incentives. The owner of a natural gas car would receive at least $200 for three years.[8]

One other federal fuel incentive that might be compared to ethanol is the the wind energy credit. This is a credit, payable to the producer, of 1.7 cents per kWh.[9] That represents 50-80 percent of the wholesale price of electricity.[10] The federal ethanol credit represents 80-85 percent of the wholesale price of gasoline.[11]

When we compare the ethanol tax incentives to those still provided for the oil industry we find a truly lopsided situation. A recent in-depth report by

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[6] Assuming 600 gallons of gasoline per vehicle-year(15,000 miles driven and 25 miles per gallon) and a federal tax incentive of 5.4 cents per gallon.

[7] Deductions range from $2,000 for cars and trucks weighing up to 10,000 pounds and up to $50,000 for trucks over 26,000 pounds and buses seating 20 or more passengers. Businesses installing fueling stations are allowed deductions up to $100,000.

[8] If we assume the cost of vehicle conversion is $2000, a three year writeoff and a 30 percent tax bracket. This excludes any tax benefits for the fueling apparatus.

[9] The wind energy credit increases with inflation, unlike the ethanol credit.

[10] The wholesale price of electricity ranges from 2-3 cents per kWh.

[11] The wholesale price of gasoline is about 65 cents per gallon. Since ethanol constitutes about10 percent of the gasoline, the federal tax incentive is 5.4 cents per gallon.

Professor Jenny Wahl found the incentives provided to the mature oil industry far surpass those given to the still embryonic ethanol industry.[12]

According to Dr. Wahl's conservative analysis, the tax incentives provided to the oil companies range from $3.3 to $10.9 billion a year. These are some five to 15 times greater than those given to the ethanol industry.[13]

We should not limit our inquiry into the oil industry's incentives simply to the tax code. Currently one quarter of the world's oil supply come from Persian Gulf countries. Two thirds of known oil reserves lie in the Gulf. The Pentagon spends $26-63 billion each year to protect access to Mideast oil. It seems reasonable to suggest that these costs should be borne by those who consume oil. If this were done, the cost to motorists would come to 19 cents a gallon.[14]

ILSR's report also estimated the environmental and health costs of gasoline. Our survey of the literature found a remarkable range of estimates, from $25.5 billion to $267 billion. This translates into 9.8 cents to $1.03 per gallon. We chose a very conservative estimate of 11.5 cents per gallon.

Our overall conclusion was that the oil industry receives incentives totaling over 32 cents per gallon of gasoline consumed. This compares to ethanol's incentives of about .6 cents per gallon of gasoline consumed.[15]

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[12] Jenny B. Wahl, *Oil Slickers: How Petroleum Benefits at the Taxpayer's Expense.* ILSR. Minneapolis, MN. August 1996. Dr. Wahl is Associate Professor of Economics at Saint Olaf College in Northfield, Minnesota. She has worked in the U.S. Treasury Department's Office of Tax Analysis and earned her PhD in Economics from the University of Chicago. The following analysis is taken from this report.

[13] The ethanol industry receives about $750 million in federal tax benefits per year. ILSR's report included only those tax incentives that the oil industry would receive over and above those that a traditional industry would receive. For example, the Congressional Research Service has found that the effective tax rate on oil and gas extraction income is 11 percent compared to the statutory rate of 35 percent. Other industries have effective tax rates much closer to the statutory rate.

[14] The cost would also be borne by those using heating oil and those who use petrochemicals. Currently the Pentagon is supported primarily from the general income tax. There are a number of tax shifting proposals being debated in Congress. Many Republicans support a shift from income to sales or value added taxes. Shifting the cost of the military, in part, from income taxes to oil taxes would be in keeping with this philosophy.

[15] The federal incentive is 54 cents for the ethanol itself and since ethanol is mixed as a 10 percent blend, the cost per gallon of gasoline comes to 5.4 cents. Our calculation assumes the cost of the federal excise tax incentive for ethanol is $750 million a year and total gasoline consumption of 120 billion gallons.

Conclusion

Three times before in history, environmental concerns led the federal government to reformulate its gasoline. Three times before the oil companies chose a 100 percent fossil fueled alternative that created more problems than it solved. Today, for the fourth time, the federal government is demanding changes in our transportation fuels. Let's not make the same mistake. This time we should make sure that a renewable fuel is the additive, and in the long run, the fuel, of choice.

Thank you.

Statement of Senator Max Baucus
on the MTBE Crisis and the Future of Renewable Fuels

Mr. Chairman, the Committee's attention to this important and multi-faceted matter comes at a very opportune time. The nation's dependence on foreign oil has increased to well over half of our consumption, making us increasingly vulnerable to the types of OPEC-directed price increases of recent months. Rural communities are suffering from depressed commodity prices. Evidence of global warming from manmade greenhouse gas emissions continues to accumulate. And, MTBE contamination is affecting the water supply of thousands if not millions of Americans. All of these issues are wrapped up in the matter before the Committee this morning.

Approximately 3 months after Saddam Hussein's army invaded Kuwait, the Clean Air Act Amendments of 1990 were enacted into law. As Senator Dole pointed out just before the final vote, that Act contained "real opportunities within the reformulated fuels portion" of the bill for agriculture to be part of a "sound environmental policy that has the added policy benefits of providing domestic energy security and budget savings from farm outlay programs by increasing farm income." He was talking about the use of ethanol to satisfy the Act's 2% oxygen content (by weight) requirement for reformulated gasoline (RFG) sold in nonattainment areas.

Unfortunately, the opportunity for growth in ethanol has been stifled by the choice of oil companies to use methyl tertiary butyl ether (MTBE) as their preferred way to supply oxygen in RFG. Over the last ten years, MTBE (used as an oxygenate in fuel) consumption has increased from approximately 1 billion to over 3 billion gallons. In contrast, ethanol (in gasohol) consumption has grown from about 700 million gallons to 900 million gallons.

The use of oxygenates has been very beneficial in achieving significant reductions in toxics from motor vehicles. They have helped exceed the performance goal for air toxics reductions in the Clean Air Act by replacing other hazardous octane enhancers. Some have suggested that they have also contributed to reductions in ozone precursors and produced other benefits. We should do all that we can to preserve and perhaps even improve on that record.

At the same time, however, MTBE has been detected in ground water in many parts of the country at levels that make the water undrinkable and expensive to treat. The primary source of MTBE in ground water seems to be leaking underground storage tanks and related systems. We must be sure that whatever choices we make on the nation's fuel system do not result in further contamination of our water supplies or harm to other natural resources.

Aside from these policy considerations, Congress also should consider the impacts that any measure may have on the Highway Trust Fund and General Revenues, its ability to meet the ambitious goals for petroleum replacement in the Energy Policy Act of 1992, and the net effect on greenhouse gas emissions.

The EPA's Blue Ribbon Panel on Oxygenates in Gasoline has provided us with some suggestions for amending the Clean Air Act to address the problem. The Administration has sent up its principles for resolving it. Last year, the Senate adopted a Sense of the Senate resolution that is generally consistent with both these proposals. And, numerous measures to address MTBE contamination have been introduced in both Houses.

Clearly, this situation requires a timely, comprehensive and bipartisan solution. As my colleagues may know, in my capacity as the ranking member on the Senate Environment and Public Works Committee, I have been working with Senator Daschle and others to develop legislation that would preserve the air quality benefits of the RFG program, enhance our energy security and rural economy by requiring a renewable fuel component, phase down MTBE use, and improve the underground storage tank program. I am hopeful the members of the Environment Committee will be able to begin constructive discussions soon on the various pieces of legislation on this subject which have been referred to the Committee. We should be able to produce a bill, after due consideration of this and other Committee's contributions, that can pass the Senate in the near future.

I look forward to the testimony of today's witnesses. Their statements will ensure that Congress makes an informed decision about the future of the RFG program and renewable fuels. This testimony will provide a valuable complement to the hearings already held in the Environment Committee.

STATEMENT OF SENATOR TIM JOHNSON

SENATE AGRICULTURE, NUTRITION, AND FORESTRY COMMITTEE

NOMINATION HEARING FOR CHRISTOPHER MCLEAN - USDA RUS ADMINISTRATOR

HEARING ON ELIMINATION OF MTBE, THE USE OF ETHANOL, AND RENEWABLE FUELS

APRIL 11, 2000

Thank you Mr. Chairman for conducting this hearing to consider the effects of eliminating methyl tertiary butyl ether (MTBE) on ethanol, the reformulated gasoline (RFG) program, the current oxygenate requirement in RFG, and the future of renewable fuels. These are complex and sometimes controversial issues, but, Congress must address them in order to set in place a framework for clean air and water, sustainable energy policy, and growth in the production of renewable (and alternative) fuels which serves as a catalyst for greater economic opportunities in rural America.

Before discussing these issues Mr. Chairman, I want to express my support for Christopher A. McLean to become Administrator of the United States Department of Agriculture Rural Utilities Service (USDA-RUS). I support his nomination and will cast my vote for him very soon in a Senate confirmation floor vote. Mr. McLean served ably in the offices of Nebraska Senators Jim Exon and Bob Kerrey. Moreover, he is currently the Acting Administrator of the RUS. As such, I recently worked very closely with Mr. McLean on my rural satellite loan guarantee legislation. I am confident he will represent the interests of rural America very well on many significant matters, from telecommunications to rural water and electricity.

My principal concern on this very complex matter of MTBE and ethanol is that Congress address the elimination of MTBE in a way that protects ethanol at current levels of production, stimulates increased production of ethanol, and creates opportunities for other renewable fuels.

On March 20, 2000, the Administration announced its support to reduce or eliminate MTBE use and promote the use of ethanol when Environmental Protection Agency (EPA) Administrator Carol Browner announced that EPA would begin the process of issuing regulations to reduce or phase out use of MTBE. While EPA failed to suggest specific legislation to deal with this issue, they offered three recommendations. The first is for Congress to provide the authority to significantly reduce or eliminate the use of MTBE. The second recommendation is that Congress must ensure that air quality gains are not diminished. And the final recommendation is that Congress should replace the existing oxygenate requirement in the Clean Air Act with a renewable fuel standard for all gasoline.

I support the elimination of MTBE. Studies on rodents conclude MTBE could pose potential cancer problems in humans at high doses of inhalation. Because MTBE is very soluble, it moves through soil and into groundwater more rapidly than other chemical compounds present in gasoline. Once in groundwater, MTBE is slow to biodegrade.

Leaking underground petroleum storage tanks have resulted in the detection of MTBE, at low levels, in groundwater in many locations nationwide, and at elevated levels in some municipal drinking water wells and reservoirs.

That said, I want to commend Senator Fitzgerald of Illinois for taking the lead on legislation to eliminate the use of MTBE over a three year period. I look forward to reviewing this and other legislation filed on this very important matter.

I would like to welcome Mr. Trevor Guthmiller of the American Coalition for Ethanol (ACE) to the hearing today. Trevor is the executive director of ACE, based in Sioux Falls, South Dakota. I depend upon the insight of ACE on matters effecting ethanol and look forward to his testimony.

As Mr. Guthmiller knows, Ethanol contributes to a more diverse and strong agricultural economy in South Dakota and across the country. Just last week, over 900 farmer investors forming the Lake Area Corn Processors Cooperative broke ground near Wentworth, South Dakota to construct a facility set to produce 40 million gallons of ethanol annually. Once constructed, this plant will utilize 15 million bushels of corn as the largest ethanol plant in South Dakota, North Dakota, and Minnesota (and the eighth largest in the nation).

It is estimated by USDA that about 555 million bushels of corn will be used to produce about 1.4 billion gallons of ethanol during the 1999 - 2000 corn marketing year. This is 6 percent of the nation's corn crop. Economists estimate that when corn carryover supplies are large, the use of an additional 100 million bushels of corn for ethanol raises the price by about 4 cents per bushel. When supplies are low, the price impact is greater. The ethanol market is particularly welcome now, when the average corn price is forecast at $1.85 - $1.95 a bushel for this marketing year nationwide. This price would be the lowest season average since 1987. The ethanol market of 555 million bushels of corn, assuming a price impact of 23 cents a bushel on all corn sales, means an additional $3 billion in sales revenue to farmers producing corn. Clearly, these can be very exciting times for promoting ethanol and value added opportunities for farmers in the United States.

As most everyone knows, ethanol is also good for the environment and air quality. The air quality benefits from purer forms of ethanol can be substantial. Compared to gasoline, the use of E85 and E95 can result in a 30-50 percent reduction in ozone-forming emissions.

Finally, ethanol is critical to our overall energy security strategy in the United States because it helps lessen our dependence on foreign oil. Recent high oil prices have painfully reminded this nation the need to become more independent in this area.

Congress should adopt an approach that eliminates MTBE and insures greater dependence upon ethanol, but I understand an immediate halt on MTBE may not be realistic. Even with the construction of new ethanol plants like the one in South Dakota, in the short term, ethanol is unlikely to be available in sufficient quantity to immediately replace MTBE nationwide. Therefore, it would likely be necessary to phase out MTBE over time, as opposed to an immediate ban.

At this time, I am uncertain whether it is wise to also eliminate the oxygenate requirement in the reformulated gasoline (RFG) program. After MTBE, ethanol stands as the next popular oxygenate alternative. While some states and the big oil interests support scrapping the oxygenate requirement in the shadow of MTBE elimination, I believe this is cause for concern. If MTBE is phased out, but the oxygenate requirement remains in effect, I believe ethanol use and production would grow. Conversely, I am concerned if the oxygenate requirement is waived by EPA or by legislation pending in Congress, demand for ethanol may decline.

Nonetheless, I plan to work with my South Dakota colleague, Senator Daschle to identify avenues for greater ethanol use and opportunity for renewable and alternative fuels. Senator Daschle is working on draft legislation that would establish a renewable content requirement in all gasoline marketed in the United States. His plan would allow individual states to limit or ban the use of MTBE, and eliminate the oxygenate requirement in RFG, if a state can demonstrate it is in full compliance with federal underground petroleum storage tank controls and if it meets anti-backsliding protection for air quality and the environment.

His plan promotes ethanol production, but also, the production of renewable and alternative fuels as well through the renewable content requirement. This approach envisions a fuels market where ethanol plays a significant role, but allows for flexibility and some dependance upon other fuels as well.

In order to promote ethanol production, the bill would target incentive payments to small ethanol plants (producing less than 30 million gallons of ethanol per year) for increasing production. For every 2.5 bushels of corn utilized over and above production from a previous year, the plant would receive the price of one bushel of corn. Plants producing more than 30 million gallons of ethanol would also receive incentive payments.

Should Senator Daschle introduce this legislation I commit to work with him, agricultural interests, ethanol producers, and advocates of clean air and water to ensure everyone's interests are represented.

Thank you Mr. Chairman.

DOCUMENTS SUBMITTED FOR THE RECORD

APRIL 11, 2000

Executive Summary

Introduction

In response to growing evidence that methyl tertiary-butyl ether (MTBE) is contaminating California's groundwater and surface water, Governor Gray Davis issued Executive Order D-5-99 calling for the phaseout of this gasoline additive. Appendix ES-A contains a copy of the complete Executive Order.

What are California Agencies Required to Do?

As part of the state's response to the potential environmental and public health risks, the Executive Order requires the California Energy Commission to evaluate California's potential to develop a "waste-based or other biomass ethanol industry" and evaluate "what steps, if any, would be appropriate to foster waste-based or other biomass ethanol development in California should ethanol be found to be an acceptable substitute for MTBE."

In addition, the Executive Order requires other state agencies to undertake a series of activities to mitigate the environmental effects of MTBE and examine the fuel supply, environmental, and health implications of ethanol use in place of MTBE.

Since the other investigations that bear on the role ethanol might ultimately play in California's gasoline supply are ongoing, this evaluation of in-state ethanol supply potential does not assume any particular outcome that might be determined through these other related studies.

What is the Federal Government Doing to Promote a Biomass-to-Ethanol Industry?

The federal government has a long history of supporting research, development and commercialization activities for converting biomass to ethanol. On August 12, 1999, President Clinton signed an executive order to develop and promote bio-based products such as ethanol and bioelectricity. The President also directed several federal agencies to work together to modify federal programs toward the goal of tripling the national use of bio-based products and bio-energy by 2010. Appendix III-D contains the full text of the President's Executive Order.

Major Findings and Conclusions

The Energy Commission staff's analysis shows that ethanol fuel produced from waste and residual materials offers potential for meeting the state's oxygenated gasoline needs. As a renewable fuel, biomass-to-ethanol fuel production offers a number of potential energy, environmental and economic benefits.

Creating a viable in-state ethanol industry to capture these benefits, however, poses major challenges. The cost of producing ethanol remains high, requiring continued government price support to make it a competitive fuel additive. Developing a California ethanol industry will also require a state government role to overcome economic, technical, and institutional barriers and uncertainties. California-produced ethanol fuel will face stiff competition from out-of-state ethanol supplies and in-state petroleum products.

Commercializing new technologies for converting biomass to ethanol raises uncertainties and presents challenges that must be overcome to foster and nurture a commercial ethanol industry in California.

The lack of commercial experience with biomass-to-ethanol conversion in California and elsewhere suggests that the state would be prudent to co-fund the first several production facilities as part of a near-term demonstration effort. A demonstration would be particularly valuable to gain insight into the actual benefits and drawbacks to siting, building, and operating such facilities in California.

In addition, developing a clear biomass-to-ethanol state policy to guide and coordinate actions can help reduce the many challenges that exist to developing this industry. Supporting activities to encourage the production and use of ethanol fuel as a renewable energy source complements California's ongoing efforts to develop transportation energy alternatives.

Past Efforts on Biomass-Based Ethanol Production in California

The Energy Commission and other state agencies began work on biomass-based ethanol production and its use in transportation nearly two decades ago.

Beginning in 1980, several demonstration projects were conducted to investigate the practicality and cost effectiveness of alcohol motor fuels. While this early work showed that ethanol production was potentially viable in the state, it became evident that the economics for in-state production were not competitive with corn-derived ethanol from the Midwest.

More recent work at the Energy Commission has identified a wide variety of biomass resources in California that may be suitable feedstocks for ethanol production.

Biomass-to-Ethanol Production in the United States and California

Nearly all the ethanol used as fuel in the United States today is produced from corn-based facilities in the Midwest. Currently, one small ethanol facility in California is operating, using beverage industry waste, with a capacity of 6 million gallons of ethanol a year.

Government Incentive Programs

The economics of ethanol fuel in the United States are influenced by favorable federal tax provisions, which effectively reduce the retail price of ethanol by 54 cents per gallon. A federal small producer's income tax credit is also in place, and a number of states offer additional state tax incentives. Without these tax provisions, ethanol would probably not be produced at today's quantities in the United States motor fuel market.

California has several state programs that impact the use of certain waste feedstocks. The Rice Straw Utilization Tax Credit Program provides a tax credit to farmers who divert rice straw from open-field burning. The program offers a $15 per ton (of rice straw) tax credit, capped at $400,000 annually. In addition, the Rice Straw Demonstration Project Fund provides cost-sharing grants for promising projects to utilize rice straw.

For the conversion of municipal solid waste (MSW) to energy, a limited (non-financial) diversion credit is available through the California Integrated Waste Management Act (1989) to assist local municipalities in meeting their 50 percent waste reduction goals.

MTBE Phaseout and Demand for Ethanol in California

With the phaseout of MTBE, ethanol may be required as a gasoline additive to meet federal and state clean-burning gasoline requirements. Regulatory agency decisions in progress will likely affect the use of ethanol in the future.

As displayed in Figure ES-1, if ethanol is used to replace MTBE, estimated California demand for ethanol may be as low as 148 million gallons of ethanol in 2003 or as high as 1.15 billion gallons a year. Three California projects are in the active planning stages and, if constructed, could produce about 44 million gallons of ethanol a year by 2004. Thus, if ethanol is used to replace MTBE, most of it will initially be supplied from out-of-state sources, primarily corn-based ethanol from the Midwest.

California's Biomass Resources

California generates an estimated 51 million bone dry tons of gross waste and residual biomass resources annually from its large agricultural industry, forests and large volumes of municipal solid waste materials, that offer potential supply sources for producing ethanol.

Several factors affect how much of California's biomass resources will be available commercially. These factors include the high costs to collect and transport some feedstocks and their existing markets. The amount of feedstocks economically available to produce ethanol will change with market conditions.

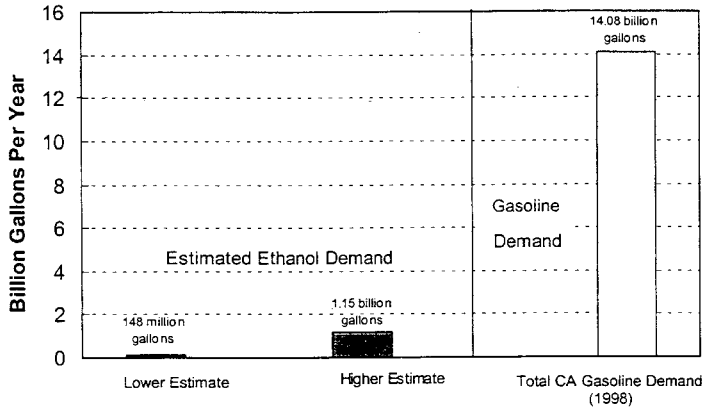

Figure ES-1. Range of Estimated Ethanol Demand for Use in California Gasoline

Other biomass resources to produce ethanol may exist, such as substantial livestock manure resources and out-of-state residues. These resources, however, will require additional study to determine their viability in this application.

The three primary categories of waste and residual biomass resources in California include forest wastes (42 percent), municipal solid wastes (31 percent) and agricultural residues (27 percent).

California's Potential Biomass Energy Crops

Biomass energy crops, grown for their energy value, represent another approach to supplying feedstocks for ethanol production. While waste-based feedstocks receive greater attention for proposed near-term ethanol production, energy crops represent a potentially larger source of longer-term supplies for ethanol production, but high costs must be overcome.

Currently, there are no plans in evidence to produce ethanol from California-grown energy crops. Limited studies of energy crops have identified sweet sorghum and eucalyptus as possible future supply sources.

Regulatory Requirements for Siting a Biomass-to-Ethanol Facility in California

Siting a biomass-to-ethanol facility in California is a complex process, which can take 12 to 18 months or longer. The location of the site and its size will determine who has jurisdiction and the responsibility as lead agency for preparing an environmental impact report and determining whether the project complies with the California Environmental Quality Act.

Ethanol Production Potential from Biomass Resources

The estimated physical upper limit for ethanol produced from California's wastes and residues exceeds 3 billion gallons a year. The actual amount of residues available, however, will be significantly lower once economic, technological, and institutional factors are considered.

Studies of biomass-to-ethanol projects were previously undertaken in California. Most did not advance beyond the feasibility phase, although a few demonstrations were conducted. Several promising technologies to convert biomass-to-ethanol, electricity and other products are being developed, and significant improvements in ethanol production costs are expected as the technologies mature.

Biomass-to-Ethanol Project Economics

The economics of biomass-to-ethanol projects are difficult to assess completely because biomass-to-ethanol technologies have yet to be demonstrated or commercially applied.

High capital costs associated with the non-commercial status of cellulosic biomass-to-ethanol technologies contribute to high risk financing. Feedstock costs represent the largest portion of the total costs, and thus the availability of low cost feedstocks is critical for producing ethanol competitively. Other project economics are subject to many unknowns and will vary with plant size, location, and other variables.

A collocated ethanol production facility and biomass power plant offer several economic advantages. Both facilities share the cost of processing feedstocks. The ethanol facility can contract with the biomass power plant to manage feedstock procurement and inventory, which reduces the fixed operating costs for both facilities. The ethanol plant can also process feedstocks that would be burned in the biomass power plant and provide lignin as fuel for the power plant (lignin is a by-product of converting biomass to ethanol). Ethanol production cost savings up to 20 percent are possible with collocation of a biomass power plant with an ethanol facility.

Ethanol's value in the gasoline blending market is determined by the price of competing gasoline (or oxygenates), its octane value, and tax incentives provided at the federal and

state level. Thus, as gasoline prices in each state change, and as tax credits vary, the price of ethanol will also vary.

Potential Public Benefits from a Biomass-to-Ethanol Industry

A number of potential public benefits may be derived from a biomass-to-ethanol industry in California.

Ethanol is an alternative fuel because it is not derived from petroleum sources. As an alternative fuel, ethanol can help California meet state and federal energy security goals, as outlined in the National Energy Policy Act of 1992. Furthermore, ethanol is a renewable fuel, and offers an effective option for reducing greenhouse gases that may contribute to global climate change.

Studies have shown that greenhouse gas reductions are possible with ethanol produced from biomass, as compared to non-renewable fuels, on a full fuel cycle basis. Based on Argonne National Laboratory analyses, ethanol in the form of E85 (85 percent ethanol blended with 15 percent gasoline) derived from cellulosic biomass (e.g., agricultural residues) can reduce carbon emissions in the range of 80 to 85 percent. In contrast, current corn-derived ethanol, in the form of E85, achieves about a 22 percent reduction in carbon emissions.

The traditional means of disposing of large quantities of agricultural and forest wastes has been open-field burning, which impacts air quality. Because of this concern, open-field burning of rice straw is being phased out. The state is seeking alternatives to open-field burning, such as converting the rice straw to ethanol, thereby reducing or eliminating this practice.

Similarly, forest residues are being open-field burned. In an effort to improve forest health and reduce the risk of catastrophic wildfires, forests are being mechanically thinned. The conversion of forest residues to ethanol provides a potentially viable alternative to burning.

Converting MSW (including paper waste, yard waste, etc.) to ethanol would reduce the volume of waste streams that are now deposited in landfills. In addition to other diversion strategies, such as recycling and composting, waste-to-ethanol may be an attractive option.

Another benefit that could arise if a biomass-to-ethanol industry develops in California is the creation of a new industry that could provide jobs and increased tax revenues for the state.

Potential Investment Risks

A number of risks exist that could impact the development of a biomass-to-ethanol industry in California.

The rate at which cellulosic biomass conversion technologies advance will impact ethanol production costs. California-based ethanol project proposers are looking at converting cellulosic feedstocks, using technologies that differ from traditional starch and sugar conversion technologies. Consequently, if cellulosic conversion technologies advance slowly, higher ethanol production costs will likely affect a California biomass ethanol industry adversely. The reverse is also true.

Delivered feedstock prices have a significant impact on the cost to produce ethanol. Higher feedstock prices could make California biomass ethanol less competitive with other sources of ethanol (i.e., Midwest corn-based) and restrict the size of a California industry.

Regulatory decisions, both by the State of California and the federal government, also will impact the ethanol market. In particular, reconsideration of the current federal mandate for oxygenates in gasoline will substantially impact the size and duration of a California ethanol market. Without clear evidence of a significant ethanol market, production plant financing will be difficult to obtain.

Recommendations to Foster Biomass-to-Ethanol Development in California

Based on the evaluation of biomass-to-ethanol fuel potential in California, the Energy Commission recommends that the state take several actions to develop a longer-term state policy, and other strategies.

These actions are divided into four categories as follows: (1) policy, (2) research, development and demonstration (RD & D), (3) market development and commercialization, and (4) further study needs. These actions represent a prudent approach to formulating a policy to guide state investment in this industry, which is now in the embryonic stage.

With regard to policy steps, California should adopt a biomass-derived transportation fuels energy policy that is consistent with Energy Commission programs and goals for the transportation sector. In addition, an interagency task force should be convened to establish and implement an integrated California biomass policy in response to several issues that go beyond the agenda of the California Energy Commission. The Governor, the California Resources Agency, or California Environmental Protection Agency should identify appropriate agencies and convene this task force.

An Interagency Biomass Group consisting of a broad cross-section of state agencies and departments has been meeting for several months to share information about biomass-related interests and activities. This group is currently working to develop a vision to better focus activities affecting the utilization of biomass. This work should provide a good platform for developing a comprehensive statewide biomass policy developed through interagency cooperation.

With regard to RD&D, California should support demonstrations of several biomass-to-ethanol facilities to establish the technical and economic feasibility of the new technologies. Further, the state should support RD& D to improve biomass feedstock collection, conversion and utilization. The appropriate financial mechanisms and extent of funding need to be determined.

With regard to market development and commercialization, California should study and determine the appropriate forms of state financial and non-financial assistance to support commercialization of the industry, should demonstration projects prove successful.

Finally, with regard to further study needs, California needs to assess and quantify the public benefits associated with the emergence of a biomass-to-ethanol industry to provide the rationale for public policy and public resource commitments in the longer-term.

How Was This Report Reviewed?

This report was reviewed by a technical peer review group of experts who reviewed an earlier working draft version of this report. Appendix ES-D provides a list of the technical peer review group members. The technical experts represent a diverse panel of individuals with particular knowledge and involvement in the field of biomass, ethanol and alternative fuels.

A public workshop was held on September 10, 1999 at the California Energy Commission. The Energy Commission staff received comments and input on the report and recommendations were discussed. More than 40 people attended the event, and 18 presentations were delivered. Appendix ES-B-1 summarizes comments received at this workshop.

On November 19, 1999, a public hearing was held at the Energy Commission to receive comments on the draft report. Approximately 40 interested parties attended the hearing and 12 speakers delivered comments. Appendix ES-B-2 summarizes comments received at the public hearing.

How Is This Report Organized?

This report has been organized for a general audience, with the technical details and documentation for the Executive Summary and chapters in a separate volume of Appendices. The following describes the contents of each chapter:

Chapter I, "Steps to Foster Biomass-to-Ethanol Development in California," examines optional steps in a "pro and con" format and identifies appropriate steps to foster biomass-to-ethanol development in California. Appendices I-A through I-D contain additional documentation for this chapter.

Chapter II, "Ethanol as a Fuel - Background," summarizes the history of ethanol as a motor fuel and the role of federal and state tax incentives in fostering an ethanol market. This chapter also discusses federal and state air quality regulations affecting the use of ethanol, the current status of ethanol production and use, and the role of ethanol in the phaseout of MTBE. Appendices II-A and II-B contain additional documentation for this chapter.

Chapter III, "Waste Biomass Resources in California," defines and describes biomass, waste biomass and residues identified as candidates for ethanol production. In addition, estimates of the physical resource potential in California for various wastes and residual biomass categories are discussed. The economic and environmental factors and challenges, including competing markets and alternative disposal options affecting the viability of ethanol production, are also examined. Appendices III-A through III-D contain additional documentation for this chapter.

Chapter IV, "Biomass Crop Resource Potential in California," examines the potential for producing ethanol in California from energy crops. It identifies different types of crops that are candidate feedstocks for ethanol production, reviews previous studies of the potential for energy crop-based ethanol production in the state, and discusses key factors that affect the prospects for achieving this potential.

Chapter V, "Biomass Conversion," describes the most competitive current technologies and probable improvements to increase the rate of conversion, yields and efficiency of ethanol production, electricity, and co-products from urban, agricultural, and forest wastes. The chapter also surveys the various technologies for converting biomass-to-ethanol, research on methods to improve them, and possible features of a mature bio-refinery industry, including opportunities to lower the costs of ethanol produced. Appendix V-A contains additional documentation for this chapter.

Chapter VI, "Biomass-to-Ethanol Production Potential in California," develops estimates of the maximum ethanol production potential in California and what is producible after addressing key technological, economic, and institutional issues. Appendices VI-A through VI-D contain additional documentation for this chapter.

Chapter VII, "Economic Evaluation," assesses the economics of biomass-to-ethanol production in California compared with obtaining ethanol from conventional sources. The analysis includes a number of different production scenarios, which incorporate different feedstocks, process options and facility size along with other considerations such as whether stand-alone or collocated with biomass power facilities. Appendices VII-A through VII-D contain additional documentation for this chapter.

The appendices provide additional information and technical details of key topics. Because of the size and number of appendices, they have been printed separately from the main body of the report. The appendices are listed here for reference:

Appendix ES-A	Governor Davis' Executive Order D-5-99
Appendix ES-B-1	Summary of September 10, 1999 Staff Workshop
Appendix ES-B-2	Summary of November 19, 1999 Public Hearing
Appendix ES-C	Glossary of Terms
Appendix ES-D	Peer Review List
Appendix I-A	State Alternative Fuel Incentives and Initiatives
Appendix I-B	Minnesota's Ethanol Incentive Program
Appendix I-C	A Producer Payment Incentive Scenario for California
Appendix I-D	California Energy Commission Alcohol Fuels Policy Resolution (1980)
Appendix II-A	Current Production Capacity
Appendix II-B	Estimates of Ethanol Demand for Use in California Gasoline
Appendix III-A	Information on Forest and Crop Residues
Appendix III-B	Summary of Biomass-Derived Transportation Fuels and Conversion Processes
Appendix III-C	State Rice Straw Utilization
Appendix III-D	President Clinton's Executive Order on Biomass Utilization
Appendix-V-A	Biomass-to-Ethanol Process Technologies
Appendix VI-A	Composition and Yields of Biomass Resources
Appendix VI-B	Location of Some Solid Waste Handling Facilities in California
Appendix VI-C	Biomass Power Plants in California
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For Immediate Release

Contact: Cindy Drucker
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NORTHEAST STATES ANNOUNCE UNIFIED MTBE STRATEGY

Call For Immediate Congressional Action

January 19, 2000 (Boston, MA) -- The Northeast States for Coordinated Air Use Management (NESCAUM) representing the eight states of New York, New Jersey, Massachusetts, New Hampshire, Vermont, Rhode Island, Connecticut and Maine today urged Congress to enact effective federal legislation regarding reformulated gasoline and MTBE. In launching a call for federal action, the Northeast states set forth six core principles that will protect the region's air and water quality while maintaining an adequate fuel supply and price stability.

The unified principles were developed by the Northeast Regional Fuels Task Force, consisting of state air and water officials. The Northeast Regional Fuels Task Force was formed to implement the recommendations included in a comprehensive RFG/MTBE study conducted by NESCAUM last summer at the request of the Northeast Governors.

Under federal law passed in 1990, Congress required reformulated gasoline to contain oxygenates such as MTBE or ethanol. Only Congressional action to lift the oxygen mandate can provide an adequate solution to concerns over current levels of MTBE use. Absent changes in federal law, states are effectively prohibited from addressing this significant public concern.

The Northeast states' principles for changes to the current reformulated gasoline program include:

1. Repeal the 2 percent oxygen mandate for reformulated gasoline (RFG) in the Clean Air Act.
2. Phase-down and cap MTBE content in all gasoline.
3. Clarify state and federal authority to regulate, and/or eliminate, MTBE or other oxygenates if necessary to protect public health or the environment.
4. Maintain the toxic emission reduction benefits achieved to date by the federal RFG program.
5. Promote consistency in fuel specifications through the timely implementation of effective federal requirements.
6. Provide adequate lead-time for the petroleum infrastructure to adjust in order to ensure adequate fuel supply and price stability.

– more –

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Jason Grumet, Executive Director of NESCAUM stated, " The federal oxygenate mandate is outdated and inappropriate national policy. These unified principles call on Congress to grant stat and industry the flexibility to preserve clean air benefits while balancing other environmental resource concerns."

Connecticut DEP Commissioner Arthur Rocque, Jr. stated, "The challenge facing the Northeast states and the nation is to identify a program that effectively mitigates the environmental risks posec by MTBE while maintaining the public health benefits of the current RFG program. We simply can no longer accept federal mandates that are barriers to that goal."

Under present federal law, gasoline sold in states must contain a 2 percent oxygenate. Robert Varney, DES Commissioner of New Hampshire remarked, "In calling for a repeal of the current oxygenate mandate, we are seeking the authority to design consistent regulations that respond to our region's environmental and economic needs."

Steve Majkut, Air Director of Rhode Island, stated, "We need to make sure that we are not throwing the baby out with the bath water. We must maintain the air quality benefits of MTBE while we allow sufficient time for the refining and distribution systems to develop an adequate supply of alternatives. We simply cannot afford a short-term quick fix that sacrifices the clean air benefits in the process."

NESCAUM also commended two recent legislative initiatives that are consistent with the principles announced today. Grumet added, "Legislative measures, such as those proposed by Congressman Greenwood (R-PA) and Senators Feinstein (D-CA), Inhofe (R-OK) and Smith (R-NH) provide a sound foundation for legislation this session. We commend their efforts to date and urge others to join in fashioning a necessary solution." Grumet also credited early initiatives by Congressmen Pallone (D-NJ), Franks (R-NJ) and Bilbray (R-CA) for raising the MTBE issue to the legislative forefront.

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Editors' Note: Copies of NESCAUM's RFG/MTBE report may be obtained through the Internet at www.NESCAUM.org or by calling (617) 367-8540.

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When You Can't Breathe, Nothing Else Matters®

AMERICAN LUNG ASSOCIATION®

For Immediate Release

Contact: Diane Maple, ALA
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ALA, NRDC Call on Congress To Enact Clean Fuel Fix To Protect Water Supplies

Washington, DC, February 1, 2000 – With Congress back in session and public concern mounting over the water pollution and health threats posed by methyl tertiary butyl ether (MTBE), a widely used fuel additive, the American Lung Association and the Natural Resources Defense Council are calling for action by Congress and the Environmental Protection Agency to "fix" the problem while maintaining the air quality benefits of the nation's reformulated gasoline program.

"Six months ago, an expert panel recommended these changes. It's time for Congress to put clean air and clean water at the top of its agenda," said John R. Garrison, CEO of the American Lung Association (ALA). "Congress should adopt the necessary changes in time for the summer smog season."

The 1990 Clean Air Act Amendments require the "reformulation" of gasoline to reduce vehicle emissions. Reformulated gasoline (RFG) is currently required in nine major U.S. metropolitan areas with the worst ozone pollution problems and many other areas have voluntarily chosen to use RFG. MTBE or other oxygenates are required to be included in the reformulated fuel. Recent health concerns focus on gasoline leaking into public water supplies.

"While there have been huge pollution reductions in smog and cancer-causing air toxics from the switch to reformulated gasoline, Congress can no longer ignore the harm being done by gasoline and MTBE leaking into drinking water supplies," said Janet Hathaway, Senior Attorney with the Natural Resources Defense Council (NRDC). "Oil refiners have the ability to produce gasoline that achieves just as much air pollution reduction without oxygenates such as MTBE, but the law currently mandates their use. Congress should act immediately to repeal the mandate."

Congress would have to amend the federal Clean Air Act before RFG without oxygen could be sold in states other than California.

"It is also critical that Congress prohibit oil companies from producing a fuel

that is less effective at reducing smog and toxic air pollutants than the RFG sold today when they remove oxygenates. We do not need to take a step backward in combating air pollution in order to protect groundwater," said the Lung Association's Garrison.

The American Lung Association and NRDC plan to meet with Sen. Bob Smith (R-NH), newly named chairman of the Senate Environment and Public Works Committee, to support his leadership in the push for rapid legislation. Smith has already announced that holding hearings on the oxygen requirement in RFG is a top legislative priority. "Given the MTBE contamination from RFG already found in New Hampshire, Chairman Smith is the logical choice to lead this effort," said the NRDC's Hathaway.

The two groups also are asking the EPA to grant a request from California to exempt RFG sold in the state from the Clean Air Act's mandatory oxygen requirement. "California is the only state where, under the law, EPA could grant a waiver tomorrow to allow gasoline sold in the state to contain little or no MTBE. For the sake of clean air and water, they should do it," said Hathaway.

American Lung Association and NRDC representatives served on an expert panel, called the Blue Ribbon Panel on Oxygenates in Gasoline, appointed by EPA to explore the MTBE problem. Both organizations have endorsed changes in the RFG program that were recently adopted by the Northeast States for Coordinated Air Use Management (NESCAUM), which represents the eight Northeast states that currently participate in the RFG program.

The NESCAUM principles are as follows:

- Repeal the two percent oxygen mandate for RFG in the Clean Air Act.
- Phase-down and cap MTBE content in all gasoline.
- Clarify state and federal authority to regulate, and/or eliminate, MTBE or other oxygenates if necessary to protect public health or the environment.
- Maintain the toxic emissions reductions benefits achieved to date by the RFG program.
- Promote consistency in fuel specifications through the timely implementation of effective federal requirements.
- Provide adequate lead time for the petroleum infrastructure to insure adequate fuel supply and price stability.

# # #

STATE OF NEW HAMPSHIRE
OFFICE OF THE GOVERNOR

JEANNE SHAHEEN
GOVERNOR

September 16, 1999

The Honorable Tom Daschle
United States Senator
509 Haut Senate Office Building
Washington, DC 20510-4103

Re: Proposed Amendments to the Federal Reformulated Gasoline Program

Dear Senator Daschle:

Thank you for your letter of August 13, 1999 and its accompanying recommendations for changes to the federal Reformulated Gasoline (RFG) program. Your letter notes that the air quality benefits of RFG in reducing emissions of ozone precursors and numerous toxic compounds have been substantial, exceeding expectations for the program since its inception in 1995. As you know, however, the gasoline additive methyl tertiary-butyl ether (MtBE), which is used extensively in the Northeast to meet the federal oxygenate mandate associated with RFG, has been found to present a significant threat to the quality of our groundwater and surface water resources.

Concern about the use of MtBE in the Northeast's regional gasoline supply prompted me, in November 1998, as Chair of the New England Governors' Conference, to ask the Northeast States for Coordinated Air Use Management (NESCAUM) to study the use and effectiveness of MtBE as a component of gasoline and the viability of possible alternatives, including ethanol. Soon after, the U,S. Environmental Protection Agency launched a Blue Ribbon Panel to undertake a similar assessment. The conclusions of both of these efforts recommend reducing the use of MtBE in RFG dramatically, ensuring that the actual air quality benefits currently provided by RFG are retained, and providing states with clear authority and greater flexibility to regulate oxygenates and other gasoline constituents. I applaud you and Senator Feinstein for crafting a proposal that represents significant progress toward achieving these outcomes. In particular, I think the concept of a renewables fuel requirement – accompanied by elimination of the federal oxygenate mandate – holds great promise and represents a wise precedent for the nation to establish.

Your letter thoroughly reviews the advantages of renewable fuels, from both environmental and economic perspectives. While the economic advantages for the agricultural Midwest are clear, I am concerned that a renewable fuels mandate could have a significant financial impact on consumers in the Northeast who may – at least initially – find themselves subsidizing renewable fuel credits. Implementation of such a

STATE HOUSE, CONCORD, NH 03301 (603) 271-2121

requirement over an appropriate time period, as your proposal prudently contemplates, is thus essential. I believe that other important implementation issues, such as evaporative emissions, averaging provisions, and shoulder season co-mingling, can also be successfully addressed. I know that these and other issues have been carefully considered by NESCAUM, so your effort to reach out to NESCAUM to review and revise this proposal should assist materially in developing a solution that is satisfactory to all.

I must also mention two additional personal concerns regarding our joint efforts to find a national solution to the MtBE problem. First, we must have a truly national solution. I have recently become aware that some in Congress would like to undertake a single-state solution, leaving other states – including those in the Northeast – to suffer continued contamination of their water supplies. This is simply unacceptable.

Second, we in New Hampshire appear to have a greater sense of urgency of the need to reduce the threat of MtBE contamination than many jurisdictions. Legislation passed this spring, for example, authorized the State to limit MtBE concentrations in gasoline and directed the New Hampshire Department of Environmental Services to seek from EPA an immediate, temporary waiver from the reformulated gasoline program. As you can see, if the oxygenate problem is not solved promptly, the entire RFG program – and its significant air quality benefits – could be jeopardized. As a result, New Hampshire supports moving as expeditiously as possible to determine and implement a national solution, including an aggressive schedule for reducing and/or phasing out MtBE as a gasoline additive.

I congratulate you and Senator Feinstein for your efforts to balance environmental quality, economic well being, and energy supply and sufficiency in shaping a national resolution to these complex fuel issues. We appreciate your interest in helping all states retain the demonstrated public health benefits of cleaner burning gasolines and minimize the environmental threats posed by the continued usage of MtBE. Please let me know of any way that I can help to ensure the prompt passage of this important legislation to preserve clean, healthy air and protect our precious water resources.

Very truly yours,

Jeanne Shaheen

Jeanne Shaheen

cc: NH Congressional Delegation

STATE OF MAINE
OFFICE OF THE GOVERNOR
1 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0001

ANGUS S. KING, JR.
GOVERNOR

September 28, 1999

The Honorable Thomas Daschle
United States Senate
Washington, DC 20510-4103

Dear Senator Daschle:

Thank you for sharing your legislative proposal to amend the Reformulated Gasoline (RFG) oxygen standard in the 1990 Clean Air Act Amendments. Let me first say that I am very encouraged that a federal solution may emerge within the next year to help Maine and other states combat the problem of MTBE contamination in groundwater. After reviewing your proposal, I believe it can help establish the proper foundation upon which each state or region can achieve its respective goals.

While the RFG program has provided significant air pollution benefits, there is clear evidence that the use of MTBE in this fuel has contributed to widespread groundwater contamination. I cannot, in good faith, advocate the increased use of MTBE to reduce air pollution, while increasing the contamination of groundwater. Maine, for example, relies on groundwater for the majority of its drinking water, and therefore, widespread contamination of our groundwater with MTBE is simply unacceptable. For these reasons, and the lack of flexibility under federal law to reduce the oxygen content and limit MTBE, Maine has abandoned the RFG program in its entirety. The recent Environmental Protection Agency (EPA) -sponsored Blue Ribbon Panel and the Northeast States for Coordinated Air Use Management (NESCAUM) studies have confirmed Maine's analysis of MTBE and my belief that the Clean Air Act's oxygen standard poses a very real threat to groundwater and public health.

As you know, the path forward is a difficult one, not only for Maine, but also for the rest of the country. Gasoline powered vehicles represent one of the most significant sources of air pollution in terms of ozone forming pollutants and air toxics. Thus reformulation of gasoline is an appropriate means of achieving our environmental goals and protecting public health, as long as this fuel does not have unintended negative environmental consequences.

In light of these considerations, Maine's immediate goals are to:

1) eliminate the RFG oxygen level mandate in the Clean Air Act;
2) reduce or eliminate the use of MTBE in gasoline; and,

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3) assist with the development of a regional or seasonal fuel that achieves the original air quality goals of the RFG program without the increased use of MTBE.

It appears that your proposal and our goals are consistent on a number of points. I particularly support the following aspects of your bill:

- the gradual reduction of MTBE to pre-RFG levels;
- the ability of states to further regulate or phase-out MTBE;
- the ability of states to regulate MTBE and to opt-out of the oxygen requirement (I would prefer the oxygen mandate to be removed from the Clean Air Act); and,
- the maintenance of air quality benefits that have been provided by the RFG program.

While I understand your concern that the elimination of the oxygenated requirement has the potential of reducing the amount of ethanol used as a motor vehicle fuel, it will be difficult to increase the use of ethanol in Maine or the Northeast. Inadequate supplies and distribution infrastructure interfere with the use of ethanol in the Northeast, and causes considerable apprehension over the renewable fuels requirement of your proposal. I understand there is recognition of these problems in your bill, since there are provisions of a national average renewable fuel standard and a ten-year phase in period for the renewable fuels requirement. I also have concerns that an ethanol-blended fuel will not be as useful to resolve our particular air quality problems during the summer. Nonetheless, I am sensitive to the needs of farmers everywhere, and I certainly am willing to discuss how our mutual interests can be met.

I appreciate your leadership on this important issue, and I look forward to continuing our dialogue as Congress considers this matter. As a first step, I have asked Jim Brooks, Director of Maine's Bureau of Air Quality, to contact your staff to discuss our respective goals.

Sincerely,

Angus S. King, Jr.
Governor

Cc: Senator Olympia J. Snowe
Senator Susan Collins
✓ Commissioner Martha Kirkpatrick, MDEP
Jim Brooks, MDEP, Air Bureau
Jason Grumet, NESCAUM

September 3, 1999

Dear Senator Daschle:

On behalf of NESCAUM's eight member states, I welcome this opportunity to share our thoughts on your legislative proposal to amend the federal reformulated gasoline (RFG) requirements found in the Clean Air Act.

As you know, the Northeast region is one of the largest consumers of RFG and MTBE in the nation. Despite achieving substantial pollution reductions over the past decade, many Northeast states remain in nonattainment of the federal ozone standard. Moreover, all states in our region and most in the nation exceed public health thresholds for a host of toxic air contaminants emitted by gasoline powered motor vehicles. While the Northeast region clearly needs the air pollution benefits of RFG, growing concerns about the presence of MTBE in groundwater have caused many to question the merits of the RFG program. The lack of flexibility under present law to reduce oxygen content and limit MTBE volumes has left Maine no option but to abandon the RFG program altogether.

The Northeast states strongly desire the flexibility and clear authority to maintain the substantial air quality benefits of the RFG program while limiting the use of MTBE. Toward this end, NESCAUM appreciates your effort to build the consensus necessary to enable a narrow amendment to the 1990 Clean Air Act. We believe that it would be counterproductive to initiate a comprehensive revision of the Clean Air Act at this time. Therefore, we welcome the opportunity to bring our region's political diversity to the challenge of developing the bi-partisan consensus necessary for legislative success.

Before providing detailed comments on the draft legislation, I would like to share the principal conclusions reached during our recently completed study on RFG and MTBE in the Northeast.

- RFG has provided substantial public health benefits to millions of Northeast state residents. These public health benefits substantially outweigh public health risks from the increased use of MTBE in the Northeast. However, the persistence and mobility of MTBE in groundwater has convinced us that a reduction in MTBE use is necessary to protect water resources.

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- In the Northeast, the only immediately available replacement for the volume and octane provided by MTBE are highly toxic compounds. Several of these compounds, unlike MTBE, are known human carcinogens. Moreover, present ambient levels of a number of these toxic gasoline constituents (benzene, 1,3 butadiene, acetaldehyde) exceed air quality health based thresholds throughout our region and most of the nation. The unusual tension between MTBE's benefit to public health and risk to environmental quality requires prudence as we seek to diminish MTBE use.

- Over the next several years, ethanol and alkylate provide opportunities to replace MTBE without posing unacceptable increases in air toxics as long as anti-backsliding provisions are enacted. In the Northeast, questions about ethanol supply and distribution networks and concerns about increased fuel volatility need to be better understood before we encourage policies that require the use of ethanol in our region. At present, little is known about the environmental fate and transport of alkylate and its combustion products. Rigorous testing of alkylate, including a thorough public health analysis, is needed before we substantially increase the volume of this compound in Northeast gasoline.

The northeast states are committed to charting a pathway that effectively mitigates the unacceptable risk MTBE poses to our water resources while maintaining the full air quality and public health benefits of the RFG program. We know that you share these goals and look forward to working with you and your staff in the coming months.

The following discussion summarizes our thoughts regarding key legislative provisions. Detailed comments and suggested revisions are attached.

State Flexibility and Authority to Regulate Oxygenates - We strongly endorse your effort to provide states with the measured authority necessary to fulfill our obligation to protect the environment and our natural resources from MTBE contamination. In order to cost-effectively reduce MTBE use in our region, states must be given relief from the 2% oxygen mandate. Our preference is to have the oxygen mandate lifted outright. However, we believe that a streamlined, state-based waiver process designed to avoid bureaucratic delay and limit litigation may provide an acceptable alternative for the Northeast. We recognize the value of consistent national and regional fuel standards. Given the opportunity, the Northeast states will work with the U.S. EPA as a region to provide consistent regulation of gasoline additives.

Anti-backsliding Provisions to Protect Air Quality – We strongly support your commitment to maintain the air quality benefits presently achieved by the RFG program. At present, RFG in the northeast is providing 75 percent greater air toxic reductions than required under law. Lifting or waiving the oxygen requirement will enable, and in some cases encourage, refiners to increase the volume of high toxicity gasoline blending components in RFG at a considerable cost to public health. At a minimum, future clean-burning gasoline must maintain the actual benefits of the RFG program we are achieving today.

Conventional gasoline in the Northeast produces 13 percent less toxic air pollutants than before the advent of RFG. Changes in the RFG program may significantly affect the quality of the conventional gasoline pool. Maintaining the last decade's improvement in conventional fuel quality must also be a goal of anti-backsliding provisions. A continuing concern about conventional gasoline quality may be exacerbated by a transition from MTBE to ethanol. The statutory one pound Reid vapor pressure waiver for gasoline containing at least ten percent ethanol will increase hydrocarbon emissions if ethanol use in conventional gasoline increases during the summer months. Preservation of current air quality benefits will require either the elimination of this waiver, or other measures to offset the expected hydrocarbon increases. We offer specific suggestions that address these issues in the attached legislative analysis.

Renewable Fuels Requirement – We understand from your letter and your history of support for renewable fuels and ethanol that your willingness to play a leadership role in lifting the oxygen standard is linked to "providing a solid future for ethanol." As you are aware, at present there is no ethanol produced and hardly any ethanol used in our region. Understandably, our lack of ethanol production and distribution infrastructure and longstanding concerns about ethanol volatility create apprehension about legislative outcomes that would force the wide-scale use of ethanol in the northeast.

While we have several questions about the proposed renewable fuels requirement, we recognize that the flexibility provided in your legislation may better respond to our stated concerns about ethanol than Congressional inaction. Under the two percent oxygen mandate, RFG states' efforts to regulate or ultimately eliminate MTBE will necessitate the use of ethanol during the height of our ozone season. Moreover, market barriers and cost considerations will have no effect on the volume of ethanol required under the current scenario.

By comparison, the national average renewable standard proposed in your legislation gives us some comfort that ethanol would only enter the northeast market if supply and distribution concerns can be overcome at a reasonable costs. We appreciate that the scaled back renewable standard volumes and ten year phase-in period are designed to ensure a gradual transition for gasoline refiners and states. These features in combination with the annual averaging provision have the potential to alleviate a majority of the Northeast concerns. If fuel suppliers are able to avail themselves of market-based opportunities to average internally and with other fuel suppliers to meet the annual renewable content minimums, then we believe that ethanol will be used where it is cost-effective to do so. If averaging among fuel suppliers is not envisioned in your legislation, then we fear that ethanol could be required to be used in our region during summer months contrary to sound economic and environmental policy.

Our region maintains considerable interest in pursuing the development of bio-mass ethanol production due to its significant positive climate change, waste management and energy security attributes. If this industry develops during the time frames contemplated in your legislation, we are certain to overcome many of the supply and distribution hurdles that have hindered the development of a Northeast ethanol market to date.

From an air quality standpoint, we remain principally concerned about ethanol co-mingling and resulting increases in evaporative emissions. While evaporative emissions are a concern throughout the year, we are principally focused on avoiding volatility increases during the five month Northeast ozone season. We wish to further explore whether the averaging provisions contained in your proposal enable our states to ensure that any ethanol that enters the region is sold outside of the summer ozone season. Last, we believe that ethanol has significant potential to reduce air pollution, particularly greenhouse gas emissions. The logic of amending the Clean Air Act to contain a renewable fuels requirement would be enhanced if the nexus between the use of ethanol and air quality was made explicit. We would be happy to work with your staff to explore options for setting minimum thresholds for full fuel cycle GHG reductions or other approaches that demonstrate the necessary linkage between ethanol and clean air.

We appreciate your consideration of these initial thoughts and the more detailed comments that are attached.

Sincerely,

Jason Grumet
Executive Director

Cc: R. Perciasepe - US EPA
M. Oge - US EPA
B. Roberts - US EPA
J. Powell - Senate EPW
C. Hessler - Senate EPA
NESCAUM Environment Comissioners
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NEWS

American Petroleum Institute

For Immediate Release

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API Supportive of MTBE Recommendations

WASHINGTON, January 20 — The American Petroleum Institute issued the following statement today in support of the recommendations just released by the Northeast States for Coordinated Air Use Management (NESCAUM) on MTBE (methyl tertiary butyl ether), a gasoline oxygenate additive:

"The U.S. oil and natural gas industry supports clean air and clean water for all Americans. The recommendations released today by NESCAUM on MTBE provide a useful focus for resolving the problems resulting from the requirement to include oxygenates in federal reformulated gasoline (RFG).

"NESCAUM proposes a multi-component strategy that calls primarily upon the federal government to resolve the MTBE issue in a way that addresses air and water quality issues while preventing gasoline supply and market disruptions. This solution would be better than a patchwork of state fuel regulations.

"API supports NESCAUM's call for the repeal of the oxygen content mandate for federal reformulated gasoline. API also supports NESCAUM's recommendations that any phase down of MTBE use occur on a time schedule that allows refiners and markets to make an orderly transition. Repeal of the federal oxygenate mandate and adequate time for any phase down of MTBE are critical steps to avoid disruption of the supply and distribution chain of gasoline to consumers.

"API looks forward to continuing to work with NESCAUM, EPA and Congress to resolve these difficult issues."

#

January 20, 2000 slh (F)

3/11/00 Lincoln NE paper

Mandatory ethanol is going too far

Nebraskans can be proud that their state is one of the nation's leading ethanol producers.

It's a clean-burning fuel additive made from a renewable resource — primarily corn — that has helped reduce air pollution in smog-ridden cities. It has helped reduce the nation's dependence on imported oil.

It's clearly superior to the next best alternative, MTBE, a suspected carcinogen that comes in the form of a slippery molecule that quickly contaminates groundwater. By comparison ethanol is no more dangerous than old-fashioned corn liquor.

Those are all good reasons to support ethanol and for the federal subsidy for ethanol to continue.

Gov. Mike Johanns wants to go one step further. He wants to make the use of ethanol mandatory in Nebraska.

That's going too far. Even though there are powerful arguments in favor of ethanol, the use of government to restrict consumer choice and to favor a particular product in the marketplace should be taken only under special conditions.

For example, the argument is often made that soy products are more healthy than meat. They are low in saturated fat. People with high cholesterol are sometimes encouraged by doctors to eat soy burgers rather than hamburgers.

Do those facts justify legislation restricting Nebraskans to eating only soy burgers? Do those facts justify eliminating steak and pork chops from the diets of Nebraskans who may not suffer from cholesterol problems?

The power of government to restrict competition should be used lightly, if at all.

A better approach to coping with the danger of MTBE might be to simply ban the unsafe product, an option being considered by the U.S. Environmental Protection Agency.

Already MTBE has fouled water supplies across the nation. It has even made its way to Nebraska, even though there is no reason for the substance to be in gasoline used here. It's been detected at 18 sites in the state and may be found at more.

A probable explanation for the presence of MTBE in Nebraska is that once MTBE is blended into gasoline, it can end up anywhere. It is often mixed at the refinery and shipped by pipeline. Gasoline can be purchased on the open market. Sometimes it may make economic and logistical sense to ship MTBE gasoline to Nebraska. And so some of it ends up in some of the state's groundwater.

As the EPA considers a ban on MTBE, ethanol supporters should push hard for ethanol as the safest and most-proven additive to help reduce carbon monoxide in cities where levels of the lethal gas exceed federal standards.

No communities in Nebraska, however, have carbon monoxide levels that trigger the requirement that oxygenates such as ethanol or MTBE be added to fuel. Until such evidence can be presented, there is insufficient reason to take away the choice that Nebraska motorists now have to pump ethanol, regular or premium.

In the meantime, if the governor wants to try a mandate, we have a modest proposal: Let him serve only soy products at the Governor's Mansion. The reaction of guests to the delectable, but limited, menu might be instructive.

9 March 00.

OMAHA DAILY HERALD FOUNDED 1856
OMAHA DAILY WORLD FOUNDED BY GILBERT M. HITCHCOCK 1885
OMAHA WORLD-HERALD FIRST PUBLISHED JULY 15, 1890

Omaha World-Herald

JOHN GOTTSCHALK, *Publisher*

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DEANNA J. SANDS, *Managing Editor*

More Alcohol, Less Choice

Motorists will have fewer choices at the gas pump if the Nebraska Legislature and Gov. Mike Johanns continue a course down which they have started.

The issue is grain alcohol, or ethanol, which, when mixed with gasoline, produces a fuel that has captured about 25 percent of the Nebraska market. However, this consumer acceptance in Nebraska has been bolstered by state and federal tax exemptions designed to make alcohol-blended fuel competitive with straight gasoline. Now the Nebraska Legislature is considering eliminating the competition altogether. Support is building for a proposed state law to require most general-purpose automotive fuel sold in the state to contain ethanol.

As a general principle, government should not take sides in such matters unless a strong case can be made that intervention serves a major public purpose. In this instance, the arguments for eliminating competition haven't been persuasive.

One argument is that the financial health of corn growers and ethanol producers in Nebraska would benefit, boosting the economy of the state generally. The statement is indisputably true, but as an argument it breaks down. The power of the Legislature is not appropriately used to eliminate competition for Nebraska-produced products. If Nebraska applied a similar protectionist philosophy to beef, pork and corn, lovers of grilled tuna, among others, might be permanently out of luck. Rice Krispies might disappear from the shelves. Crab legs? Forget it.

Another argument is environmental. Governor Johanns, in a conference call with newspaper editors on Tuesday, said he was supporting the legislation because it's time the state set an environmental standard for fuel content.

Perhaps it is time, but that's an argument that could do with a good bit more scientific underpinning than has been evident so far. Johanns said ordinary gasoline contains many chemicals that could, when burned, be harmful. Of particular concern, he said, is MTBE, an additive used in some parts of the country to enhance octane while reducing carbon monoxide. At seven Nebraska locations, Johanns said, MTBE has been found in underground water.

MTBE has been linked to tumors in laboratory animals and seeps readily into water supplies. In Iowa, MTBE has been found in 29 percent of the state's monitored test wells.

However, petroleum industry spokesmen said they don't know how the additive ended up in the Midlands, where it isn't commonly added to gasoline supplies. One theory is that traces of MTBE exist in some refinery equipment, from where it passes into gasoline supplies that seep into the water from leaky underground tanks.

Ethanol also enhances octane while reducing carbon monoxide. But if no one knows precisely how MTBE has been making its way into Midlands water supplies, how can anyone make a credible claim that mandatory ethanol usage will prevent future contamination? What's to say the MTBE contamination won't continue to occur just as it has been occurring?

To say that the proposal could benefit from scientific validation should not be interpreted as hostility to the ethanol industry. There's much to be said for ethanol-blended fuels. The ethanol industry has been good for Nebraska corn growers. It has provided jobs in Nebraska communities. We hope the product has a bright future and continues to win consumer acceptance, as surely it has been doing in recent weeks, with rising petroleum prices making the ethanol blends more price-competitive.

Certainly if scientific analysis showed that a state law governing the content of motor fuel could appreciably prevent the contamination of the water supply, it might constitute justification for the state to do away with consumers' choice. As a general philosophy, however, government should be cautious about eliminating competition. The freer the marketplace to reflect the collective decisions of consumers, the greater the probability that it will provide the jobs and taxable incomes on which the government is so dependent.

Des Moines Sunday Register

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THE REGISTER'S EDITORIALS

Let ethanol prove itself

■ Iowa farmers need help, but coercion at the gas pump is wrong.

The price of corn is low, and Iowa farmers are hard hit.

So here's the deal: Let's prohibit the sale of wheat bread. From now on, only corn bread should be allowed on Iowa grocery shelves. It might help boost the price of corn.

Hog farmers are struggling, too. Why not ban the sale of other meats so that Iowans can eat nothing but pork?

No?

Well, how about requiring that most gasoline sold in Iowa be blended with corn-based ethanol?

That's an idea that has the backing of the governor and state agriculture secretary as well as Iowa's two U.S. senators.

But that doesn't make it right.

Ethanol is good for Iowa. It creates an additional market for corn. It is an alternative fuel from a renewable resource. Iowa politicians are right to promote ethanol and to provide a tax break until the industry can stand on its own feet. They are right to fight the oil lobby in its efforts to rob ethanol of its market and take away its subsidy.

Promotion is one thing. Coercion is another. An ethanol mandate would deny Iowans a choice of fuels and short-circuit the process of ethanol establishing its own worth in the marketplace. Except in places where smog problems dictate the use of an oxygenated fuel, what's the rationale for mandating ethanol?

The justification is to marginally boost the price of corn. Cleaner air is offered as a reason, too, but that's an afterthought. If that were the goal, other measures would be far

Promotion is one thing. Coercion is another.

more effective: outlawing SUVs, for instance, or quadrupling the gasoline tax.

Ethanol is not recommended for some small engines on lawn mowers, snowblowers, boats, auxiliary generators and the like. Then, too, lots of Iowans drive older vehicles or use older equipment with components that may not have been engineered to use ethanol, as newer vehicles are. Why put these people through a hassle to find the non-ethanol fuel their equipment requires?

One convenience-store chain used to advertise free repair for any engine damaged by the use of its gasoline. If the state insists on mandating the use of ethanol, perhaps it should make the same offer. Better yet, let Iowans make their own choices, and let ethanol prove itself in the marketplace.

5A QUAD-CITY TIMES Sunday, Sept. 19, 1999

Quad-City Times
Founded 1857
A Lee Enterprises Newspaper

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EDITORIALS

A NEW SUBSIDY: More fuel on the fire

Ethanol-only proposal doesn't help consumers

Chuck Grassley and Tom Harkin may have the best of intentions, but their proposal to boost ethanol use in Iowa is seriously misguided.

The two U.S. senators have signed a petition asking Iowa Secretary of Agriculture Patty Judge to require that Iowa service stations sell *only* ethanol-blended gasoline. Ethanol, as most Iowans know, is a fuel derived from a mixture of gasoline and corn-based alcohol.

Harkin and Grassley, of course, are longtime supporters of ethanol. They know that its use is good for Iowa corn farmers and that it reduces the nation's reliance on foreign oil.

But that's only half the story. Federal subsidies of ethanol now cost American taxpayers more than $770 million a year in lost revenue — largely because of ethanol's exemption from federal fuel taxes. The Congressional Research Service says that figure could reach $1 billion by next year.

And mind you, that subsidy isn't putting more money in the pockets of farmers. The real beneficiaries of the ethanol subsidy are conglomerates like Archer Daniels Midland Corp. that convert the corn into ethanol. The Cato Institute estimates that every dollar of profit now earned by ADM's ethanol operation is costing taxpayers $30 in lost revenue. That's because in addition to the federally subsidized production of ethanol, ADM also has received millions of dollars worth of free corn from American farmers, courtesy of the Department of Agriculture.

Are farmers the co-beneficiaries of the ethanol subsidy? Yes — but not to the extent that some would argue. Subsidized ethanol production *does* guarantee corn farmers a higher price for their product, but that penalizes hog farmers and cattlemen since more than half the nation's corn crop is used domestically for feed grain.

As for claims that ethanol helps the environment, the National Academy of Science, the Congressional Budget Office, the Department of Energy and even the USDA have each reported that ethanol, which is less efficient than gasoline, provides no significant environmental benefit and may even add to air pollution — which is why ethanol use was restricted in the EPA-proposed rules first issued in conjunction with the Clean Air Act of 1992.

None of this is to suggest that Grassley and Harkin are wrong to support the subsidization of ethanol at a more reasonable level — only that there is an abundance of evidence that indicates ethanol is not all that it's cracked up to be. Not for consumers, not for the environment and not for farmers. With research and continued refinements, it might someday become an economically viable alternative to gasoline — but until that day, it would be ludicrous to argue that Iowa's gas stations be required to sell only ethanol.

> "This would infringe on the rights of thousands of Iowa businessmen and put service stations in border communities such as the Quad-Cities at a competitive disadvantage."

Such an arrangement would infringe on the rights of thousands of Iowa businessmen and put service stations in border communities such as the Quad-Cities at a competitive disadvantage with gas stations in neighboring states. It also would take government subsidization of ethanol to a whole new level, essentially forcing Iowans to buy a product that already is costing them money through lost tax revenues.

The game is rigged as it is. With their million-dollar subsidies, ethanol producers are playing against their competition with loaded dice and marked cards. If they're *still* losing — to the extent that lawmakers are proposing the outright elimination of the competition — that's a sure sign that ethanol is not a product that consumers are ready to embrace.

Ethanol might be worth some level of government support, but it never will be so valuable as to justify scrapping our system of free enterprise.

The Gazette

An independent newspaper established in 1883

GAZETTE EDITORIALS

Noble motives: Still, ethanol idea is bad

IT'S ALMOST IMPOSSIBLE in Iowa these days of heightened political activity not to run into a politician — already in office or seeking office — who isn't sympathetic to the plight of American agriculture.

Even more than sympathetic, they're typically eager to offer their version of the answers to this economic slump.

Short of the government writing a check to every hog farmer who's lost $20 or $30 on every animal marketed at some point in the last year, or guaranteeing farmers will be paid at least what it costs to produce corn and soybeans, instant relief for what ails agriculture is hardly probable.

> **All of us — at least those of us whose own roots aren't too far removed from the soil — truly can say we feel the pain of Iowa farmers, and probably shouldn't object if enhanced ethanol sales jacked up corn prices a notch.**

That doesn't stop politicians from trying. We would be disappointed if they did give up.

Part of the problem is public policy. Part is global turmoil. Part is the fault of farmers who produce more than the market needs.

Which brings up the situation brought to our attention over the weekend. Sen. Charles Grassley's top aide, Ken Cunningham, has started the ball rolling toward possible implementation of a regulation mandating that all gasoline sold in Iowa be an ethanol blend. Even though lawmakers failed to consider such a mandate earlier this year, Cunningham says the Code of Iowa already empowers the secretary of agriculture to take such action.

Since an ethanol mandate on fuel sold in Iowa would give the price of corn a modest but desirable boost, the motivation for such an effort cannot be challenged.

If it is determined the law actually provides such authority, look for the push to implement its provisions to be intense.

The sense from this corner, as noted recently, is that a policy of government-mandated consumption is fraught with difficulty. It is to be avoided under every circumstance. Sure, all of us — at least those of us whose own roots aren't too far removed from the soil — truly can say we feel the pain of Iowa farmers, and probably shouldn't object if enhanced ethanol sales jacked up corn prices a notch.

But are we ready for government to tell us which fast food eatery to patronize? Or which automobiles we must buy? It's bad enough that the people we elect to public office take the money they collect from us and spend it — sometimes — on projects some may find offensive. But let's not tolerate their being so invasive into our lives as to tell us what *has* to go into the gas tanks of our cars and pickups. Or on our tables.

And if it's determined that some past Legislature managed to pull a fast one on Iowans by giving such discretion to the agriculture secretary, the next Legislature should waste no time in taking it away.

Public policy decisions should always be open to the full scrutiny of the people, not slipped in through the back door.

Robert H Campbell
Chairman
Chief Executive Officer

April 5, 2000

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Honorable Richard G. Lugar
Chairman
Senate Agriculture, Nutrition
and Forestry Committee
Room 328-A
Russell Senate Office Building
Washington, DC 20510

Dear Mr. Chairman:

I salute you for holding a hearing on gasoline additives at this time, particularly in view of the high level of public interest in the future use of methyl tertiary butyl ether (MTBE).

My company has had extensive experience over the last decade with MTBE and ethanol. We are among the industry's largest users of both of these additives. Further, I personally have been intimately involved in the policy deliberations surrounding the future use of oxygenates as a member of the EPA's Blue Ribbon Panel on MTBE (BRP).

I wholeheartedly endorse the specific recommendations that came from the BRP and urge prompt Congressional action to:

- Repeal the 2% oxygen mandate for reformulated gasoline (RFG) contained in the Clean Air Act;
- Substantially reduce the amount of MTBE use in all gasoline;
- Clarify federal and state authority to regulate MTBE;
- Maintain the toxic emission reductions achieved with the federal RFG program;
- Promote consistency in fuel specifications through timely implementation of federal requirements; and,
- Provide adequate lead-time for the refining industry to adjust in order to ensure adequate fuel supply and price stability.

Sunoco is not alone in supporting this position. An unusual "alliance" has formed around these principles which includes all the major petroleum-related trade associations: National Petrochemical and Refining Association (NPRA), American Petroleum Institute (API), Society of Independent Gasoline Marketers of America (SIGMA), Petroleum Marketers Association of America (PMAA) and National Association of Convenience Stores (NACS). More significantly, the alliance also includes the Northeast States for Coordinated Air Use Management (NESCAUM); the American Lung Association (ALA); and, The Natural Resources Defense Council (NRDC). Indeed, the NESCAUM Executive Director, Jason Grumet is scheduled to testify before your committee on behalf of the alliance.

Having indicated the legislative initiatives which we support, let me be equally clear about what we believe Congress should avoid: That would be any new fuel composition mandates. Here I make specific reference to the evolving proposals to require a specific volumetric percentage of "renewable fuel" content in the U.S. gasoline pool.

Let me give you three reasons why such a mandate is not only unnecessary but also extremely counter-productive to the domestic transportation fuel infrastructure:

1. Mandated federal fuel composition requirements were a 1990 concept that this past decade of experience has proven to be fatally flawed. The most well-intended proponents of the 2% oxygenate requirement for RFG failed to anticipate the numerous factors including technological advances that have combined to produce today's movement away from oxygen as a desirable gasoline additive. We must learn from this painful and very expensive experience, and not repeat this mistake in the decade ahead.

2. Renewables in general, and ethanol in particular, have a very robust market future. With reduced use of MTBE, coupled with sulfur content reduction in gasoline, octane demand will skyrocket over the next five years. Ethanol will be an attractive octane source everywhere that logistics economically allow. California alone will require between 50% and 80% of the entire U.S. ethanol production capacity for its fuel needs. Consequently, significant ethanol demand growth is assured and mandates are simply unnecessary

3. The domestic refining industry is embarking on a ten-year regulatory adventure into multiple, major fuel adjustments required by EPA. First we face the MTBE/reduction issue. Simultaneously, we commence the permitting, engineering and construction activities to begin the gasoline sulfur reduction program due for completion in 2004-2006. Closely overlapping this program will be the diesel sulfur reduction requirement with all the same permitting and construction overloads. Adding yet another overlapping regulatory burden to this industry virtually guarantees the failure of an already problematic set of challenges. An already fragile transportation fuel infrastructure is seriously at risk.

I realize that your committee has not solicited my input on these matters, but I respectfully request that this communication be made a part of your hearing record.

Sincerely,

Robert H. Campbell

cc: Honorable Rick Santorum
Mr. Jason Grumet

Global Biorefineries, Inc.

The Honorable Richard Lugar
The United States Senate
Washington, D.C. 20510

May 24, 2000

Dear Senator Lugar:

Thank you Mr. Chairman for the opportunity to submit written testimony for consideration by the Members and staff of the Senate Agriculture Committee.

I have been deeply involved in the ethanol industry from its inception and continue to do so today -- a quarter century later. The big lesson learned is that when times are right we have to move hard and fast. This was true with the first energy crisis in 1974; the second crisis in 78-79; the phase out of lead in gasoline (which should have been replaced with ethanol, but the oil industries turned to toxic aromatics); and the passage of the Alternative Transportation Fuels Act of 1988, the Clean Air Act in 1990, with its attack on carbon monoxide and ozone, and the Energy Policy Act of 1992, with new opportunities for alternative fuels like ethanol.

These actions forged a foundation and now, finally, conditions are set for the ethanol industry to take a big leap forward. With this, there should be a focus on strengthening the lot of farmers, ranchers, dairyman, foresters and farm communities. Those conditions are:

o A well established ethanol industry with an in-place infrastructure and a solid track record in reducing CO and ozone (when the oil companies provide the right blendstocks) and downward presures on gas prices to the consumer;

o National recognition that MTBE is causing serious problems with the ground water in many parts of the country;

o Growing and dangerous dependence of the United States and the world on OPEC oil and our rising trade deficit;

o The high price of gasoline, diesel and heating oil causing economic problems for many, and a sudden rise in inflation;

o The obvious need to further reduce CO and ozone levels through high octane, non-toxic oxygenates like ethanol without boosting aromatics (toxic and carcinogenic) and olefins in gasoline, and without negatively impacting the driveability index;

o The urgent need for the U.S. to fully engage in the reduction of greenhouse gases with American farmers taking the lead in the transition from a hydrocarbon to a carbohydrate economy;

o The equally urgent need to democratize the production of energy supplies in the U.S. so that value-added benefits remain in farm and rural communities;

o The President's Biomass Initiative and increasingly cooperative efforts within the Departments of Energy and Agriculture and the Environmental Protection Agency, as well

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supportive legislation within several states; and
o Vital national legislation sponsored by Senators Lugar and Daschle.

These powerful forces have set the stage for major advances in the biofuels industry. But there are commanding forces aligned against these advances:
o First and foremost is the major oil companies that have undermined the ethanol industry for well over a hundred years. Even though they can incorporate ethanol into gasoline to the benefit of farmers, consumers, the environment and, indeed, their own bottom line, they remain determined in their struggle against any non-hydrocarbon fuels in the transportation sector -- ensuring the future for the oil barrel is of primary importance. Of course, at a propitious time, they can use their vast capital resources and human talents to launch their own biorefineries, taking advantage of government investments and pioneering achievements of entrepreneurs. But, that would dampen the benefits to farmers, ranchers, foresters, rural communities and the opportunity to advance the democratization of energy supplies by keeping value-added benefits in rural communities.
o Second is the lack of aggressive action on the part of some government bureaucracies, at both the federal and state levels, and their failure to size upon the opportunities offered up by legislation and circumstances like those outlined above. These bureaucrats are joined in encumbering the advance of the community-based ethanol industry by organizations like the American Farm Bureau Federation that are more interested in gaining favor from major corporations and industry than honoring their obligations to farmers and rural communities.
o Then there are the major, multinational corporations in the ethanol industry, which in concert, directly or indirectly, control the industry. They simply do not want to see the industry expand beyond their control, or to the extent that the increased volume of production would: 1) Threaten ethanol's tax incentives; 2) Raise the price of corn to a level that weakens profits in the corn grinding and exporting businesses; or, 3) Flood the market with more ethanol, corn sweeteners, oil, gluten meal and feed, and other animal feeds like distillers grains and solubles. I report this with trepidation because I have clearly seen the absolutely essential contributions to the birth and health of the industry made by ADM. But, we have reached the point where the industry must expand beyond the control of the majors to the benefit of the nation, the farmers and the environment. It is my fervent wish that they will join in this next big adventure in the biofuels industry as partners rather than controllers.

To take advantage of the opportunities and to overcome the obstacles we must:
o Move now and move aggressively;
o Support Senator Daschle's legislation as it pertains to the accelerated phase out of MTBE, protection of Clean Air Act oxygenate standard, and the establishment of an aggressive Renewable Fuel Standard (RFS). The RFS must include a trading component so that areas of the country, remote from existing supplies of ethanol (until their own local production comes on line), will have the option of purchasing either ethanol or credits to meet the balance between the RFS requirement, clean air, and economic needs.
o Support Senator Lugar's and Congressman's Ewing's legislation that will contribute, in a major way, to expansion of the ethanol industry.
o Expand existing and open new markets for ethanol. This should include major increases

in E-85 refueling stations to eliminate the dichotomy between the number of FFVs using just gasoline and those using E-85. It should also include governmental action to ensure an expanding market for ethanol in hybrid electric vehicles, fuel cells and in aircraft (there is an increasing number of aircraft certified to use ethanol, but cooperative action on the part of DOE, EPA and the FAA is needed to more fully capture this market).

I suggest that the Senate Agriculture Committee, because of Senator Lugar's leadership in these areas, take the lead in gaining support within the government and helpful constituencies, and in building needed coalitions. There are several steps that can be taken:

- Work with those supporting the stabilization of greenhouse gases to make better known the fact that agriculture and forestry are even now contributing in a major way to emissions reduction through sustainable agriculture and forestry practices. It is equally important to inform the public that biofuels, bioenergy and biochemical industries will add important dimensions to the reduction of greenhouse gas emissions through replacing fossil-based products with carbon-neutral, plant-based products, and, in doing so, stimulate rural economies;
- Encourage the major oil and ethanol industries to work cooperatively with the Congress to find solutions that truly serve the nation, particularly rural communities and the environment;
- Turn to the smaller organizations representing farmers and rural communities as well as to environmental and public interest groups to establish positions of primary importance to these organizations and groups – position that will also advance the ethanol industry; and
- Include the auto industry in the process of finding solutions so that this important industry will be more supportive of the use of ethanol. This would include:

1. National gasoline standards that include oxygenates and biofuels while leading to improved engine performance and reduced emissions - this would include reductions in aromatics, olefins and sulfur as well as an optimized driveability index.
2. Continue the alternative fuel vehicle credits under CAFE standards.
3. Flexibility in on-board canister standards to accommodate the periodic higher Rvp of ethanol blends under limited circumstances. Promoting ethanol gasoline blends where the ethanol content is always above 22% would solve that problem.
4. Ensure that the oil companies do not offer inferior gasolines as blendstocks for ethanol, even though the blendstocks are sub-Rvp to accommodate ethanol.

Thank you for the opportunity to express my vision for the ethanol industry based on a through understanding of the past.

Times are right for a major expansion of the industry. It is time to move hard and fast, not delaying progress by trying to harness favorable conditions for political gain. The overall political process and the confidence of the public will benefit from the rapid implementation of the above recommendations.

William C. Holmberg
President